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POES IJPS

Polar-orbiting Operational Environmental Satellite (POES)

Ground Segment Command and Data Acquisition and Satellite Operations Control Center Requirements for the IJPS

December 20, 2001

Prepared by:

U.S. Department of Commerce
National Oceanic and Atmospheric Administration (NOAA)
National Environmental Satellite, Data, and Information Service (NESDIS)

NOAA/NESDIS

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AReplace pages 3.4-1 through 3.4-10 with change pages 3.4-1 through 3.4-10b@
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Preface

This document comprises the NOAA/NESDIS baseline publication of the Polar-orbiting Operational Environmental Satellite (POES) IJPS Requirements for the Command and Data Acquisition (CDA) and Satellite Operations Control Center (SOCC) (October 01, 2001, issue). This document is Revision 0, DCN 0 (document number NOAA-POES/OSD-2001-0010R0UD0).

This document identifies requirements for the NOAA CDA and SOCC elements of the POES Ground Segment for IJPS. The intent is to provide a baseline future upgrades needed to perform Metop satellite related functions required to sustain the joint NOAA/EUMETSAT system called the Initial Joint Polar-orbiting Operational Satellite System (IJPS).

Future updates and revisions to this document will be produced and controlled by NOAA/NESDIS.

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1 Introduction

The National Oceanic and Atmospheric Administration (NOAA) has entered into an agreement with the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) for participation in the Initial Joint Polar System (IJPS) (hereinafter referred to as the "IJPS Agreement"). In the IJPS Agreement, NOAA and EUMETSAT agree to procure and operate their Polar-orbiting satellites in a manner beneficial to both parties and the world's meteorological community.

The IJPS consists of two independent, but fully coordinated, polar satellite systems: the NOAA Polar-orbiting Operational Environmental Satellite (POES) system and the EUMTSAT Polar System (EPS). In support of the IJPS, NOAA satellites NOAA N and N` will be flown consecutively in a polar orbit with an afternoon (P.M.) equatorial crossing time. NOAA N and N` will be the IJPS POES satellites. EUMETSAT, working together with the European Space Agency (ESA), will develop the Meteorological Operational (Metop) series of satellites to be flown consecutively in a Polar orbit with a mid-morning (A.M.) equatorial crossing time. The Metop satellites comprise the space segment of the EUMETSAT Polar System. The mid-morning and afternoon satellites will embark a set of jointly provided common instruments. In addition, instruments specific to each orbit will be provided by NOAA and EUMETSAT for their respective satellites. The IJPS Agreement also commits NOAA and EUMETSAT to supporting each other's operational satellite through their respective ground segments for commanding, receiving telemetry and global data, as well as exchanging data between the two Polar satellite systems. IJPS begins with the commissioning of the first METOP satellite to be launched.

POES is a long-standing operational satellite system. The POES Ground Segment (PGS) currently operates and generates meteorological products from POES satellites. Among other components the PGS includes two Command and Data Acquisition (CDA) stations and a Satellite Operations Control Center (SOCC). The CDAs provide commanding access to the POES satellites and acquisition of POES telemetry and meteorological data. They are located at Wallops Island, Virginia (WCDA) and Fairbanks, Alaska (FCDA). The SOCC is the center of POES operations and is responsible for command and control of the POES spacecraft and instruments. The PGS including the CDAs and SOCC must be upgraded in order to fulfill NOAA's commitments to IJPS.

Until NOAA N becomes operational, pre-IJPS NOAA satellites will provide the instrument data for the meteorological community. After the launch of NOAA N residual POES satellites will still be operated by the PGS. Support functions to these non-IJPS satellites will continue into the IJPS timeframe.

1.1 Purpose

The purpose of this document is to establish the requirements for the CDA and SOCC modifications necessary to meet the PGS IJPS requirements.

1.2 Scope

This document addresses only capabilities not already provided by the existing CDAs and SOCC.

1.3 Document Organization

Section 1 provides the background, purpose and document structure.

Section 2 provides a brief description of CDA and SOCC elements and planned modifications for IJPS operational support.

Section 3 provides requirement statements for IJPS CDA and SOCC upgrades.

Section 4 covers keywords and definitions.

Section 5 documents open issues.

Appendices include the Acronym List and the traceability matrix.

1.4 Applicable and Reference Documents

Table 1-1 presents a list of applicable (AD-#) existing requirement and operations documents. The applicable documents form a part of this specification to the extent specified within.

Table 1-1 Applicable Documents

Doc #	Title	Reference Number	Issue	Date
AD-14	EPS/NOAA Joint Operations Rules and Procedures	TBD		11/13/98
AD-15	NOAA Ground Segment to EPS Ground Segment Interface Control Document	TBW		
AD-16	Metop Space to Ground Interface Specification	MO-IF-MMT-SY0001	4	07/26/99
AD-20	Communications Element ICD	TBW		

Reference documents

Reference documents (RD-#) in Table 1-2 provide additional useful information for program implementation.

Table 1-2 Reference Documents

Doc #	Title	Reference Number	Issue	Date
RD-2	NOAA Baseline Polar Orbiting Environmental Satellite (POES) Command and Data Acquisition (CDA)	NO-IJ/SO-99-0008R0U0	#2	11/30/99

	and Satellite Operations Control Center (SOCC) Equipment Configuration			
RD-3	NOAA IJPS Communications Requirements	TBD	Final	9/30/99
RD-4	NOAA IJPS Communications Architecture Study	TBD	Final	9/1/99
RD-5	NOAA PGS Interface Definition for IJPS Level 0 and Telecommand Data	TBD	Final Draft	10/4/00
RD-6	NOAA Ground Segment Level 0 and Telecommand Data Communication Architecture Options in the IJPS Period	TBD	Final Draft	March 01
RD-7	Software Requirements Specification for the Polar Acquisition and Control System	ISI-169-24	Rev A	Dec 90
RD-8	POES Ground Segment Upgrade Description for IJPS	NO-IJ/OSD-99-0005-R0U0	TBD	TBD
RD-15	EPS Core Ground Segment Interface Requirements on NOAA Ground Segment	EPS/SYS/IRD/980916	2.0	08/13/99
RD-16	NOAA Interface Requirements on EPS Core Ground Segment	EUM.EPS.SYS.SPE.900202.0	2.0	08/13/99

2 CDA and SOCC Upgrades

2.1 CDA and SOCC Overview

The CDAs and the SOCC play important roles in the POES Ground Segment. Together they provide the POES instrument and satellite command and control along with the reception of environmental data from the POES satellites. Much of the functionality of the CDAs and SOCC is implemented in common software and identical hardware that is present in FCDA and WCDA and the SOCC. Logically one might consider the CDA and SOCC to be separate elements in the PGS but because they actually run a common system it is best to consider the three to be one "super" element in the PGS. One development will provide the upgrades necessary for IJPS.

2.1.1 Current CDA

A CDA station's current primary mission is to meet the command, telemetry, data acquisition and selected data routing requirements of the POES system. The CDAs contain the antennas, RF and switching equipment that provide the space-to-ground and ground-to-space links with the POES satellites. This equipment is configured, controlled and monitored by processes executing in CDA processing hardware. Interfaces with the POES satellites are described in RD-2, RD-3, and defined in RD-11.

Command loads are generated by the SOCC usually well in advance of a commanding session. During the satellite contact the CDA does the final command processing and transmits commands to the POES satellite. Real-time commands can be generated either at the SOCC or generated at the CDA.

A CDA can receive, process and route POES HRPT, AIP, TIP, GAC, LAC, STIP and SAIP data. During normal contacts only TIP, HRPT, GAC and LAC data are downlinked. Downlinked data is recorded at the CDA. Real-time telemetry is retrieved from the downlinked TIP, simultaneously processed locally and forwarded in real-time to the SOCC. HRPT data is also normally forwarded to Suitland in real-time. GAC and LAC data that had been stored on the POES satellites and received and recorded at the CDA during the satellite contact is played back after the pass and sent on to Suitland. If necessary any downlinked POES mission data can be recovered from the short-term CDA archive.

The CDA interfaces with the SOCC and other PGS components are through leased SATCOM and Ground communication systems. RD-3, RD-4, RD-5, and RD-6 discuss this and future communication architectures.

FCDA and WCDA performs monitor and quality control functions. CDA processes monitor the status of the CDA, its hardware and communications links as well as the quality of the acquired data.

Satellite contact/pass activities are scheduled by the SOCC and can be executed by the CDA. Synchronized schedules are running simultaneously in the SOCC and CDA during satellite contacts. This automated execution allows the CDA to be operated from the SOCC. However if necessary the CDA can execute the schedule without the SOCC or the CDA can be operated manually.

2.1.2 Current SOCC

All PGS command and control and data acquisition activities are directed from the SOCC. Current SOCC responsibilities include: a) planning, scheduling, controlling and monitoring SOCC, CDA and communication resources in support of the POES satellites; b) command generation and formatting; c) telemetry processing and satellite health and status monitoring; d) trending; e) telemetry archiving; f) database management; g) navigation; h) test and training support; and i) engineering management.

The SOCC plans and schedules both the POES satellite activities and POES ground segment activities. Contact level scheduling plans the satellite contacts that will be taken at FCDA and WCDA. CDA resource conflicts are resolved on a priority basis in determining which satellites will be supported by which CDA at what times. The SOCC determines the events that can take place during each satellite orbit. This includes data to be recorded on the satellite, when and what downlinks will occur, what uplinks will occur, as well as calibrations and other support and housekeeping activities. The SOCC then builds the stored command table (SCT) which is loaded into the satellite CPU during a commanding session (usually once a day). Satellite operations are directed by this SCT. The SOCC also creates a command level schedule to configure the ground segment equipment in consonance with satellite activities. Through the execution of synchronized schedules the SOCC remotely configures and controls CDA equipment and software. The SOCC also has the ability to manually configure CDA equipment and software. The SOCC monitors schedule execution and CDA status.

The SOCC receives POES ephemeris files from the Control Environment Satellite Computer System (CEMSCS) twice a week. The SOCC generates spacecraft ground tracks, spacecraft/CDA contacts, equator crossings, and SBUV instrument events based on this predicted ephemeris.

Satellite commands originate either from the automated SOCC schedule or manually from a local workstation. The commands are sent to the CDA responsible for the satellite contact via a dedicated narrowband communication link. The CDA is responsible for the final command processing and transmission to the satellite. Four levels of command verification are provided.

During a satellite pass real-time telemetry is simultaneously received at the SOCC from the CDA through two methods. Telemetry that was processed out of the TIP downlink at the CDA comes via the dedicated narrowband communication link. Real-time telemetry is also embedded in the HRPT that is delivered to the SOCC via a SATCOM link. SOCC operators select which real-time telemetry source to process. Telemetry processing can also be applied to back-orbit telemetry that is collected during satellite passes. Telemetry processing includes frame synchronization, decommutation, Engineering Unit (EU) conversion, limit checking, pseudo-

telemetry generation, on-line history archiving, and trend processing and archiving. Telemetry processing capabilities of the CDAs and SOCC are equivalent. During pre-launch activities and during launch, telemetry can be received through the Goddard Space Flight Center (GSFC) and or from the satellite factory. A special Launch Control Room in the SOCC supports POES launch activities.

All of acquired telemetry, real-time or back-orbit data, is decommuted and stored in segment files. These files are further processed and stored in a history archive. This data may be used to generate analysis reports or played back as an input to the real-time processing software. Trending is performed on selected data parameters and then stored.

The SOCC manages and maintains the operational databases. The telemetry database contains the information needed by the real-time telemetry process to convert the raw satellite telemetry counts into engineering units. The command database contains a list of valid satellite commands, the format to transmit them in, and any pre-requisite states of the satellite prior to execution of the command. The display page database consists of a description of all of the operator display pages within the SOCC and CDA system. The SOCC also provides configuration management of the POES Flight Code. The SOCC monitors status and performance and has the capability to generate reports on data quality and event histories.

The SOCC has the capability to train operators. It includes a spacecraft simulator that supports test and training.

A capability exists to fail over from the SOCC to a CDA during critical time periods when the SOCC cannot successfully perform its mission. PGS CDAs have the capability to provide command transmissions to and data acquisitions from the spacecraft without the SOCC. During short-term outages, both PGS CDAs back up the SOCC. If SOCC operations are suspended for longer than 24 hours, the Wallops CDA becomes the operational SOCC. In long-term outages SOCC personnel are relocated to Wallops to perform the additional functions not normally performed by the CDA staff. During launch and early orbit, the SOCC makes use of Air Force Satellite Control Network (AFSCN) and Deep Space Network (DSN) resources for commanding and receiving telemetry from POES satellite.

Additional information on the current baseline for the CDA and SOCC architecture and functionality can be found in RD-2, RD-7 and RD-11.

2.2 IJPS Overview

IJPS is the integrated combination of the NOAA POES System and the EUMETSAT Polar System. These two independent systems are operated in a fully coordinated fashion with integrated data flows. In the IJPS era NOAA will provide the afternoon satellite (NOAA N followed by NOAA N'). EUMETSAT will provide the morning satellite (Metop-1 followed by Metop-2). Both NOAA and EUMETSAT satellites will carry a core set of instruments (AVHRR/3, HIRS/4, AMSU-A1/-A2, DCS, SARSAT, SEM, and MHS) that will continue the data collections of earlier NOAA POES satellites. In addition to the core instruments NOAA N and N' will carry a SBUV/2 instrument and Metop-1 and 2 will carry IASI, ASCAT, GRAS, and

GOME-2 instruments. The DCS and SARSAT instruments NOAA N will carry are earlier generation versions of those flown on the other IJPS satellites.

The two IJPS ground segments (PGS and EPS Ground Segment) will each operate its own satellites and provide blind-orbit and cross support functions to its partner's IJPS satellites. In blind-orbit and cross support situations the partner's ground segment becomes an extension of ones own ground segment for commanding, real-time telemetry retrieval and global data receipt. The EPS Core Ground Segment (CGS) will be the primary EPS interface with the PGS. All IJPS global satellite data acquired by a ground segment is made available to the other ground segment. Global data is Metop Global Data Stream (GDS) and POES Global Area Coverage (GAC) data. When GAC data is unavailable from a POES satellite then either SAIP (Stored AMSU Instrument Processor) or STIP (Stored TIROS Information Processor) data is exchanged instead. The satellite data exchange will occur through Single Door interfaces located at Suitland, Maryland, and Darmstadt, Germany. The PGS will deliver all acquired global data (POES and Metop) and Metop cross support telemetry to the Suitland Single Door and will receive Metop cross support commands there. In a similar fashion the PGS will receive all EPS CGS acquired global data (POES and Metop) and cross support IJPS POES telemetry at the Darmstadt Single Door and will deliver cross support IJPS POES commands there. Performance requirements for the interfaces between the EPS CGS and the PGS can be found in RD-15 and RD-16.

For the two ground segments to operate in such a virtually integrated fashion much coordination and data exchange will be necessary. Joint processes are defined in AD-14. A common voice-loop exchange will exist in both ground segments to support joint operations.

PGS IJPS operations begin with the first METOP satellite to be commissioned.

2.2.1 CDA Upgrades

In general current CDA capabilities are expected to be adequate to support NOAA N and N'. However NOAA N will carry the Microwave Humidity Sounder (MHS) instrument provided by EUMESAT and the updated High Resolution Infra-Red Sounder (HIRS/4) instrument provided by NOAA. NOAA N' will carry MHS, HIRS/4 and two upgraded NOAA provided instruments (A-DCS and SARP-3). FCDA and WCDA must provide the capability to monitor the real-time telemetry for these new instruments, and generate and uplink commands for them.

Additional capabilities are required to support Metop satellites. Metop Space to Ground interfaces are defined in AD-16. The Fairbanks CDA must be capable of supporting the Metop satellite passes. Because of the location of the EPS CGS CDA, the CGS has no actual blind Metop orbits. However, situations may arise when FCDA support will be needed. The CGS will request FCDA support when desired. The SOCC will receive the CGS requests and schedule the FCDA resources.

During a scheduled FCDA pass, Metop will downlink a Hard-Keyed QPSK 70 Mbps GDS bit steam at X-Band for approximately 6 minutes of the CDA acquisition window. Metop will also downlink a PM Modulated 4.096 kbps telemetry bit stream for the complete duration of the CDA

acquisition window. If commanding support is requested, the FCDA will uplink to Metop a NRZ-L-Phase Shifted Keyed (NRZ-L-PSK) command bit steam at 2 kbps in S-band. The commands will be sent in a throughput mode as received from the Communications Element.

New FCDA capabilities include:
- Autotracking of X-band signals during Metop passes
- Demodulation of the GDS data stream
- Bit synchronization of the GDS data stream
- Frame synchronization of the GDS data stream
- RF modulation for the Metop command uplink
- Demodulation of the Metop telemetry (TM) stream
- Bit Synchronization of the Metop TM stream
- Frame Synchronization of the Metop TM stream

GDS data is in CCSDS format. The FCDA will Reed-Solomon decode the GDS data, determine the resulting quality and time stamp the data with Universal Time Code (UTC). The UTC time stamp and the quality flag are appended to the GDS data that is provided to the Communications Element to be forwarded to Suitland. In real-time the Metop telemetry stream is UTC time stamped and sent on to Suitland.

The EPS Core Ground Segment will bent-pipe command the Metop satellite using the Suitland Interface and the FCDA. The FCDA will have the capability to create the NRZ-L-PSK command bit steam for uplink to the Metop satellite. The FCDA will also acknowledge receipt of Metop commands and return the acknowledgment (via the Communication Element) to the Suitland Interface in real time.

In addition to the IJPS agreements with EUMETSAT, NOAA desires to collect and process Metop High Resolution Picture Transmission (MHRPT) data during CDA passes. Both PGS CDAs must be modified to acquire MHRPT data and extract a subset to be sent to the Ingest and Preprocessing System (IPS). MHRPT is a Hard-Keyed QPSK 3.5 Mbps bit stream at L-Band. The data is received for the complete duration of the CDA acquisition window.

FCDA and WCDA must have the capability for:
- autotracking of L-band signals during Metop passes
- control tracking of antennas during Metop passes
- Demodulation of the MHRPT data stream
- Bit synchronization of the MHRPT data stream
- Frame synchronization of the MHRPT data stream

MHRPT data is in CCSDS format. FCDA and WCDA will viterbi and Reed Solomon decode MHRPT data and filter the output to be sent to IPS. Selected VCDUs will be forwarded from the CDA.

FCDA and WCDA will have at a minimum a rolling 7-day archive of the all of the global data it receives from IJPS POES and Metop satellites.

The current PGS CDA capability to configure, control and monitor hardware and software processes must be extended to cover IJPS hardware and software.

RD 8 also discusses FCDA and WCDA upgrades for IJPS.

In IJPS, the WCDA will serve as the Backup SOCC. As such the WCDA capabilities will include:
- Coordination with CGS for IJPS POES cross support
- Receiving Blind GAC from Darmstadt
- POES Commanding through Darmstadt
- Receiving blind POES TM from Darmstadt
- Receiving POES command echoes from Darmstadt
- Managing Communications Element resources for IJPS operations

2.2.2 SOCC Upgrades

The SOCC responsibilities for the IJPS POES satellites are identical to the responsibilities it has for current POES satellites. Additional SOCC capabilities are required to support Metop satellites and to use EPS resources for IJPS POES satellites. IJPS POES satellite contacts through the IJPS PGS CDAs will be similar to POES operations today. However, some IJPS POES satellite contacts will be via an EPS CGS CDA. Routinely three to four blind-orbit passes a day will be via the CGS. Other cross-support contacts can be coordinated with EUMETSAT when needed. Telemetry and mission data downlinked during CGS passes will be delivered to the Darmstadt Single Door and transported by the NOAA Communications Element (CE) to Suitland. The SOCC can command through the Darmstadt Single Door and CGS during such satellite contacts. The SOCC must have the capability to exercise its command and control functions using both PGS and CGS resources.

As discussed in Section 2.2.1 IJPS POES satellites carry new instruments. The SOCC must provide the capability to process telemetry, monitor health and status, trend performance and state of health, archive telemetry, plan instrument operations and generate and format commands for these new instruments. SOCC displays, databases and procedures must support these instruments. The SOCC must also be capable of providing POES MHS telemetry to EUMETSAT.

In addition to current scheduling capabilities the SOCC must plan and schedule IJPS POES passes at CGS CDAs, MHRPT collections at POES CDAs, and (when requested) Metop contacts at the FCDA. Stored Command Tables for the IJPS POES satellites must reflect CGS CDA contacts. PGS CDA station command level schedules must reflect the Metop and IJPS POES passes at that station. The SOCC works in close coordination with the CGS to plan and schedule. Data and voice links must be set up with the CGS as discussed in AD-14.

The SOCC monitor and control functions must be extended to include IJPS-unique PGS equipment, software, and communication resources. Reporting functions also must be expanded for IJPS.

SOCC test and training resources must be upgraded to properly reflect IJPS satellites operations.

The IJPS Agreement dictates that the IJPS PGS include a geographically separate backup SOCC to carry on IJPS operations in the absence of the SOCC. The backup SOCC will be located at the Wallops CDA.

RD-8 also discusses SOCC upgrades for IJPS.

3 CDA/SOCC Upgrade Requirements

A single development will provide the upgrades to the POES Ground Segment CDAs (Fairbanks and Wallops) and the SOCC needed to support IJPS. This development will be referred to as the CDA/SOCC Upgrade or CSU. Many requirements are equally applicable to upgrades being made to both the CDAs and to the SOCC. As such, they state capabilities and properties that the CSU is required to have. There are also requirements unique to the upgraded SOCC and others that are unique to the upgraded CDAs. Some CDA-unique requirements are only applicable to the Fairbanks CDA (FCDA) and some are only applicable to the Wallops CDA. Other CDA-unique requirements apply to both PGS CDAs. In IJPS the PGS will contain both an upgraded SOCC and a backup SOCC. The Backup SOCC will provide much of the functionality of the SOCC.

Requirements are identified with unique Requirements IDs followed by paragraphs of text. Also associated with each requirement is a verification method. The format is as follows:

Requirements ID Verification Method Text Paragraph

- **Requirement ID** The requirement header is in the form "CSU-<Context>-<a.b.c.d.>-<number>"
  - **CSU** stands for CDA/SOCC Upgrade,
  - <**Context**> corresponds to one of the ground segment components or to a common category as defined in Table 3-1
  - <**a.b.c.d.**> corresponds to the subsection in which the requirement is contained.
  - <**number**> is a sequential number.
- **Text Paragraph** is the requirement statement
- **Verification Method** lists the method(s) selected for verification of the requirement. The list of verification methods is given in Table 3-2
-

Table 3-1 Requirement Context

Context Field	Definition
CR	Common Requirements applicable to both PGS CDAs and the SOCC
CDA	Command and Data Acquisition Station unique
SOC	Satellite Operations and Control Center unique

Table 3-2 Verification Methods

Verification Field	Definition
TEST	Test is the exercise of hardware, software, or operations to measure quantitatively specified requirements.
DEMONSTRATION	Demonstration is the determination of properties and performance involving proof-by-doing.
ANALYSIS	Analysis is an engineering assessment and/or mathematical process that may include computer modeling and/or simulation to determine compliance with specification requirements.
INSPECTION	Inspection is the examination or measurement of product characteristics or the review of design, production or test documentation to determine compliance with specified requirements.

3.1 CDA/SOCC Upgrade Common Requirements

Requirements applicable to blind orbit cross support also cover the specific cases of contingency support for satellite operations (Global data, TM, TC) upon request for such operations.

CSU-CR-3.1-0010 Demonstration, Analysis
The CSU shall not impact the ability of the PGS to meet existing POES System requirements [PGSL-3.2.2.1 -010].

CSU-CR-3.1-0020 Demonstration, Analysis
The CSU shall provide at a minimum identical functionality for IJPS POES satellites as that provided for POES satellites by the POES CDAs and SOCC [PGSL-3.2.2.1 -010, PCDA-3.3.2.1-030/040].

CSU-CR-3.1-0050 Analysis, Test
The CSU shall be compatible with the EUMETSAT Ground Segment regarding required data exchange [PGSL-3.2.2-3-020/021/025/030/040/050, PDCA-2.2.1.1040/080/090/100/120].

CSU-CR-3.1-0060 Demonstration, Analysis
The CSU shall support continuous, 24 hours a day, seven days a week operations [PGSL-3.2.2.1-010].

CSU-CR-3.1-0070 Demonstration, Analysis
The CSU shall provide tools necessary for a trained operator to accomplish allocated tasks within allocated time and system performance requirements [PSYS-3.1.4-020, PGSL-3.2.2.1-010].

CSU-CR-3.1-0100 Analysis
The CSU shall support IJPS POES split mission operations [PCDA-3.3.1.1-110, PSOC-3.3.2.1-020/040/130/140/ 150/170/180/190].

CSU-CR-3.1-0110 Demonstration, Analysis
The CSU shall support IJPS operations, backlog processing, reprocessing, validation processing, and system test (IJPS and PGS) [PGSL-3.2.2.2-010/030, PCDA-3.3.1.2-020/030/040].

3.1.1 Monitor and control

CSU-CR-3.1.1-0010 Analysis
CSU shall not degrade the current SOCC and CDA system capabilities to protect data, software and processes against destruction, denial of service, unauthorized modification and disclosure to unauthorized individuals [PGSL-3.2.2.1-010].

CSU-CR-3.1.1-0020 Demonstration

CSU system modifications relating to control, monitoring, and reporting shall be capable of being integrated into the existing CDA/SOCC POES baseline system [PGSL-3.2.2.1-010].

CSU-CR-3.1.1-0030 Demonstration
The CSU shall provide the capability for operators to monitor new equipment configurations used in support of IJPS satellites [PGSL-3.2.2.4-020, PCDA-3.3.1.2-020/030, PCDA-3.3.1.4-030].

CSU-CR-3.1.1-0040 Demonstration
The CSU shall provide the capability for operators to monitor schedule execution in support of Metop satellites and new IJPS POES satellite activities. [PGSL-3.2.2.1-010, PDCA-3.3.1.1-020/025/050, PCDA-3.3.1.2-020, PSOC-3.3.2.1-010/030/040/050/060/070/080/090/100/110/130/150/160/170/090/210].

CSU-CR-3.1.1-0050 Demonstration
The CSU shall provide the capability to monitor operational status of hardware, equipment, software, internal networks and external networks, used to support IJPS satellites [PGSL-3.2.2.4-020, PCDA-3.3.1.2-020, PCDA-3.3.1.4-030, PSOC-3.3.2.1-030].

CSU-CR-3.1.1-0060 Demonstration
The CSU shall provide the capability to detect and notify operators of frame data errors, frame losses, and sync losses in a) Metop satellite telemetry, b) Metop GDS data streams, and c) MHRPT data streams received at the PGS CDAs [PGSL-3.2.2.4-020/060/070, PCDA-3.3.1.2-020, PCDA-3.3.1.4-030, PSOC-3.3.2.1-030].

CSU-CR-3.1.1-0070 Demonstration
The CSU shall provide the capability to notify operators of an out of nominal condition for hardware and software resources delivered by the CSU development [PGSL-3.2.2.4-020, PCDA-3.3.1.2-020, PCDA-3.3.1.4-030, PSOC-3.3.2.1-030].

CSU-CR-3.1.1-0080 Demonstration
The CSU shall provide the capability to point ground antennas at and track Metop satellites to support commanding and downlink collection [PCDA-3.3.1.1-020/025/050, PCDA-3.3.1.2-020, PSOC-3.3.2.1-050/060/080].

3.1.2 Commanding and Telemetry processing

CSU-CR-3.1.2-0010 Demonstration
Metop TC shall pass through the CSU in a throughput mode from the Suitland Interface [PGSL-3.2.2.2-040, PCDA-3.3.1.1-040/050].

CSU-CR-3.1.2-020 Demonstration
Metop telemetry shall pass through the CSU in a throughput mode to the Suitland Interface [PGSL-3.2.2.2-040, PCDA-3.3.1.1-040/050].

CSU-CR-3.1.2-030 Demonstration
FCDA, WCDA and the SOCC shall provide the capability to monitor the health and status of IJPS POES MHS instruments in real time. [PSOC-3.3.2.1-025/180/190]

CSU-CR-3.1.2-040 Demonstration
FDCA, WCDA and the SOCC shall be able to ingest, decommutate, archive and trend IJPS POES MHS telemetry. [PSOC-3.3.2.1-025/180/190]

3.1.3 Data Storage

CSU-CR-3.1.3-0010 Demonstration
The CSU shall provide the capability to associate attributes with each piece of Metop recorded and archived data to include at a minimum: a) date and time, b) data identifier, c) satellite, d) orbit number [PGSL-3.2.2.1-010, PCDA-3.3.2.1-030/040, PCDA-3.3.1.4-020].

CSU-CR-3.1.3-0020 Demonstration
The CSU shall provide the capability to retrieve recorded and archived Metop data by data identifier and the following sort criteria, at a minimum: a) date and time, b) satellite, c) orbit number [PGSL-3.2.2.1-010, PCDA-3.3.2.1-030/040].

3.1.4 Anomalies and Contingency

CSU-CR-3.1.4-0020 Test
The CSU shall provide the capability to recognize and continue operations in the event that IJPS POES data received from the Suitland Interface is corrupt (e.g. corrupted at source), is duplicated (e.g. downlinked twice), is out of time sequence, is incomplete, or is missing (e.g. between passes) [PGSL-3.2.2.1-010, PCDA-3.3.1.1-020/025/050/080, PSOC-3.3.2.1-010/030/040/050/060/070/080/090/100/110/130/150/ 160/170/190/210].

CSU-CR-3.1.4-0030 Demonstration
The CSU shall provide operators the capability to direct the failover to redundant CSU equipment and interfaces in the event of failure of on-line equipment or interfaces [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.2-020, PCDA-3.3.1.4-030, PSOC-3.3.2.1-020/030/040/050].

CSU-CR-3.1.4-0040 Demonstration, Analysis
The CSU shall provide capabilities which aid in detecting, diagnosing and resolving anomalies in the IJPS POES MHS instruments [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.4-030].

CSU-CR-3.1.4-0050 Demonstration, Analysis
The CSU shall provide capabilities which aid in detecting, diagnosing and resolving anomalies in CSU ground resources [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.2-010,PCDA-3.3.1.4-030].

CSU-CR-3.1.4-0060 Demonstration, Analysis
The CSU shall provide support to the investigation and response to in-orbit anomalies and emergency situations related to the NOAA-provided instruments on Metop satellites [PCDA-3.3.1.1-080, PSOC-3.3.2.1-50/60/120/200].

3.1.5 Operational Requirements

CSU-CR-3.1.5-0010 Demonstration, Analysis
The CSU shall be capable of providing support to Metop satellite operations upon the successful completion of the System Commissioning Review (SCR) for that Metop satellite [PCDA-3.3.1.2-010, PSOC-3.3.2.2-010].

CSU-CR-3.1.5-0020 Demonstration, Analysis
The CSU shall be capable of supporting IJPS POES satellite operations upon the successful completion of the On-orbit Verification Review for that POES satellite [PCDA-3.3.1.2-010 PSOC-3.3.2.2-010].

CSU-CR-3.1.5-0030 Demonstration, Analysis
The CSU shall provide the capability to support Early Orbit testing of IJPS POES Satellites simultaneously with normal IJPS operations [PGSL-3.2.2.4-020, PGLS-3.2.2.1-010].

CSU-CR-3.1.5-0040 Demonstration, Analysis
The CSU shall provide the capability to support IJPS POES satellite pre-launch activities simultaneously with normal IJPS operations [PGSL-3.2.2.4-020, PGLS-3.2.2.1-010].

CSU-CR-3.1.5-0050 Demonstration, Analysis
The CSU shall provide the capability to support IJPS POES satellite commissioning activities simultaneously with normal IJPS operations [PGSL-3.2.2.4-020, PGLS-3.2.2.1-010].

CSU-CR-3.1.5-0060 Demonstration, Analysis
For instruments provided by NOAA to Metop 1 and 2, the CSU shall provide the ability to support Metop post launch checkout, commissioning and operations [PIP-6.2, Item 3 PIP-5.2.2].

CSU-CR-3.1.5-0070 Demonstration
The CSU shall provide the capability to complete the transfer of IJPS Satellite Global data (GAC/STIP/SAIP, GDS) for orbit N, via the Communications Element, to the Suitland Interface prior to the start of pre-pass activities for Orbit N+1 [PGSL-3.2.2.1-190, PCDA-3.3.1.1-120, PSOC-3.3.2.1-210].

3.1.6 Test and V&V Support

CSU-CR-3.1.6-0010 Analysis

All necessary test points shall be provided within the CSU that are required to perform in a repeatable fashion the integration, verification and acceptance of the CSU [PGSL-3.2.2.1-010, PGSL-3.2.2.2-010/30, PGSL-3.2.2.3-020/050].

CSU-CR-3.1.6-0020 Analysis
All necessary data injection points shall be provided within the CSU to perform in a repeatable fashion the integration, verification and acceptance of the CSU and to support space vehicle testing [PGSL-3.2.2.1-010, PGSL-3.2.2.2-010/30, PGSL-3.2.2.3-020/050].

3.1.7 External Interfaces

CSU-CR-3.1.7-0010 Test, Demonstration
The CSU shall deliver data to the Suitland Interface in formats in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PGSL-3.2.2.3-020/030].

CSU-CR-3.1.7-0020 Test, Demonstration
The CSU (in conjunction with the Communications Element) shall make NOAA IJPS POES Global data available to the Suitland Interface in a manner that allows such data to be transmitted in pipeline mode to EUMETSAT [PGSL-3.2.2.3-020/030].

CSU-CR-3.1.7-0030 Demonstration
The CSU (in conjunction with the Communications Element) shall make Metop GDS data available to the Suitland Interface in pipeline mode [PGSL-3.2.2.3-020/030].

CSU-CR-3.1.7-060 Demonstration
If GAC data is unavailable from an IJPS POES satellite, the CSU shall provide CDA acquired Stored AIP (SAIP) or Stored TIP (STIP) at the Suitland interface [PGSL-3.2.2.1-070/150/160,PCDA-3.3.1.4-090,PSOC-3.3.2.1-070/160].

3.1.8 Maintainability

CSU-CR-3.1.8-0010 Analysis
The CSU upgrades shall be maintainable over the IJPS lifetime [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.8-0020 Analysis, Inspection
It shall be possible to perform failure investigation (e.g., H/W, S/W and communication investigations) in parallel with but, without detrimental impact on, normal operations [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.8-0030 Analysis, Inspection
It shall be possible to perform hardware and software maintenance activities on the CSU in parallel with, but without detrimental impact on, operational activities [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.8-0040 Analysis, Inspection
It shall be possible to release a new version of any configuration controlled CSU item without detrimental impact on the availability of the PGS [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.8-0050 Demonstration Analysis, Inspection
CSU hardware shall be developed and selected such that maintenance can be performed on site [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.8-0060 Demonstration
The CSU shall provide on-line help to operators for any new or modified software [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

3.1.9 Reliability, Dependability and Availability

CSU-CR-3.1.9-0010 Demonstration, Analysis, Inspection
The CSU shall provide diagnostics and system configuration programs for fault detection (failure and degradation), fault isolation, indication alarms and control necessary to meet reliability and availability requirements [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.9-0020 Demonstration
Automated and/or manual diagnostics to isolate faults to the LRU shall be provided for all CSU installed equipment [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.9-0030 Analysis
The downtime of the CSU IJPS GAC acquisition chain from a CDA antenna to the Suitland Interface shall not exceed 360 minutes [PGSL-3.2.2.4-080].

CSU-CR-3.1.9-0040 Analysis
The downtime of the CSU Metop GDS acquisition chain from the FCDA antenna to the Suitland Interface shall not exceed 360 minutes [PGSL-3.2.2.4-080].

CSU-CR-3.1.9-0050 Analysis
The downtime of the CSU Metop TM acquisition chain from the FCDA antenna to the Suitland Interface shall not exceed 100 minutes [PGSL-3.2.2.2-040].

CSU-CR-3.1.9-0060 Analysis
The downtime of the CSU Metop TC transmission chain from the Suitland Interface through the FCDA antenna shall not exceed 100 minutes [PGSL-3.2.2.4-090].

CSU-CR-3.1.9-0070 Test, Analysis
The CSU shall have an overall system availability of 99.6% [PGSL-3.2.2.4-020].

CSU-CR-3.1.9-0080 Test, Analysis
The downtime of the CSU MHRPT acquisition chain from a CDA antenna to the Ingest and Preprocessing system shall not exceed 360 minutes [PGSL-3.2.2.4-110].

3.1.10 Design

CSU-CR-3.1.10-0010 Analysis
CSU delivered hardware shall be capable of interfacing with existing PGS hardware [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.10-0020 Analysis
CSU hardware equipment, operating system and COTS software shall be selected from product families: 1) whose availability is ensured over the IJPS PGS lifetime. 2) that ensure upward compatibility between the successive versions of a given product [PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040].

CSU-CR-3.1.10-0030 Analysis
The CSU hardware shall be developed or selected to be supportable or upgradable over the IJPS PGS design life [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.10-0040 Analysis
The CSU software shall be developed or selected to be supportable or upgradable over the IJPS PGS design life [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.10-0050 Analysis
Each of the CSU subelements shall offer the necessary level of modularity to allow system functional or performance evolutions with limited impact on the system design [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.10-0060 Analysis
The CSU hardware design shall support the update of operational hardware without disruptions to mission functions that exceed IJPS reliability, availability and dependability requirements [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.10-0070 Analysis, Inspection
Hardware delivered by the CSU development shall not increase CDA and SOCC facility thermal and humidity control requirements [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.10-0080 Analysis, Test
New CSU equipment shall be sized with 50% computer reserve capacity for input/output and processor computing throughput during any period of peak load conditions [PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040].

CSU-CR-3.1.10-0090 Analysis
New CSU equipment shall provide sufficient disk storage to meet CSU IJPS requirements with 50% reserve [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

CSU-CR-3.1.10-0100 Analysis, Test
The CSU LANs shall provide sufficient bandwidth to meet CSU IJPS requirements with 50% reserve [PGSL-3.2.2.4-020, PCDA-3.3.1.4-030/040].

3.1.11 Reserved

3.1.12 Performance

CSU-CR-3.1.12-0010 Test
The CSU shall deliver the first IJPS GAC data via the Communications Element to the Suitland Interface no later than 120 seconds after loss of signal. The CSU shall be allocated 119 (TBC) seconds of the 120 seconds [PGSL-3.2.2.4-030].

CSU-CR-3.1.12-0020 Test
The CSU shall complete delivery of IJPS GAC data to the Suitland Interface no later than 100 minutes after completion of the GAC dump. The CSU shall be allocated 5999 (TBC) of the 6000 seconds [PGSL-3.2.2.4-030].

CSU-CR-3.1.12-0040 Test
During split mission operation the CSU shall provide the capability to process and deliver to the Suitland Interface any of the following with the same performance as during nominal operations.

a) 2 orbits of GAC
b) 1 orbit GAC and 1 orbit of SAIP
c) 1 orbit GAC and 1 orbit of STIP
d) 2 orbits of SAIP
e) 1 orbit of SAIP and 1 orbit of STIP
f) 2 orbits of STIP

[PCDA-3.3.1.1-110, PSOC-3.3.2.1-170]

CSU-CR-3.1.12-0050 Test
The CSU shall deliver the first Metop GDS data via the Communications Element to the Suitland Interface no later than 120 seconds after completion of the GDS dump. The CSU shall be allocated 119 (TBC) seconds of the 120 seconds [PGSL-3.2.2.4-040].

CSU-CR-3.1.12-0060 Test
The CSU shall complete delivery of Metop GDS data to the Suitland Interface no later than 100 minutes after completion of the GDS dump. The CSU shall be allocated 5999 (TBC) of the 6000 seconds [PGSL-3.2.2.4-040].

CSU-CR-3.1.12-0080 Test
The delay between the Metop TM frame complete acquisition at the FCDA and its delivery via the Communications Element to the Suitland Interface shall be less than 1 second. The CSU shall be allocated .75 seconds (TBC) of the 1 second [PGSL-3.2.2.4-070].

CSU-CR-3.1.12-0100 Test
Metop TC shall be uplinked to the Metop satellite within 1 second of receipt at the Suitland Interface. The CSU shall be allocated .75 seconds (TBC) of the 1 second [PGSL-3.2.2.2-040].

CSU-CR-3.1.12-0118 Test, Analysis
The CSU shall complete delivery to the Ingest and Preprocessing System via the Communications Element of filtered MHRPT VCDUs within TBD of sensing [PGSL-3.2.2.4-110].

CSU-CR-3.1.12-0130 Test, Analysis
The CSU shall ensure that TBD % (measured over any 30-day period) of the filtered MHRPT VCDUs are delivered via the Communications Element to the Ingest and Preprocessing System within timeliness requirements [PGSL-3.2.2.4-110].

CSU-CR-3.1.12-0140 Test, Analysis
CSU performance requirements (CSU-CR-3.1.12-0010, CSU-CR-3.1.12-0020, CSU-CR-3.1.12-0030, CSU-CR-3.1.12-0040) shall be met when SAIP or STIP data is provided to the Suitland interface instead of GAC data [PGSL-3.2.2.1-070].

CSU-CR-3.1.12-0150 Analysis
The CSU shall provide the capability to support one operational Metop satellite at a time [PGSL-3.2.2.1-120, PCDA-3.3.1.1-080, PSOC-3.3.2.1-120].

3.2 Upgraded CDA Unique Requirements

CSU-CDA-3.2-0010 Demonstration, Analysis
FCDA and WCDA shall provide the capability to carry out all necessary pre-pass, pass and post past CDA activities for Metop [PGSL-3.2.2.1-010, PCDA-3.3.1.1-020/030/040/050].

3.2.1 Monitor and Control

CSU-CDA-3.2.1-0010 Demonstration
FCDA and WCDA shall provide the capability to locally configure and control IJPS CDA hardware and software [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.2-010, PCDA-3.3.1.4-030/040].

CSU-CDA-3.2.1-0020 Demonstration
Local control of the new CSU hardware and software shall be through a) local automated execution of the schedule and/or b) manual commands [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.2-010, PCDA-3.3.1.4-030/040].

CSU-CDA-3.2.1-0030 Demonstration
FCDA and WCDA shall provide the capability to override automated sequences [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.2-010, PCDA-3.3.1.4-030/040].

CSU-CDA-3.2.1-0050 Demonstration
FCDA and WCDA shall provide the capability to configure and control local CDA antennas for IJPS support [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.2-010, PCDA-3.3.1.4-030/040].

CSU-CDA-3.2.1-0060 Demonstration
FCDA and WCDA shall provide the capability to configure and control local IJPS RF equipment for Metop support [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.2-010, PCDA-3.3.1.4-030/040].

CSU-CDA-3.2.1-0070 Demonstration
FCDA and WCDA shall provide the ability to reconfigure CSU hardware during IJPS satellite contacts [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.2-010, PCDA-3.3.1.4-030/040].

CSU-CDA-3.2.1-0080 Demonstration, Analysis
FCDA and WCDA shall provide the capability to locally monitor IJPS hardware and software resources [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.2-010, PCDA-3.3.1.4-030/040].

CSU-CDA-3.2.1-0090 Demonstration
FCDA and WCDA shall provide the capability to monitor CDA operations in support of IJPS [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.2-010, PCDA-3.3.1.4-030/040].

CSU-CDA-3.2.1-0100 Demonstration, Analysis

FCDA and WCDA shall provide the capability to monitor the data quality of downlink acquisitions from Metop satellites [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.2-010, PCDA-3.3.1.4-030/040].

3.2.2 Data acquisition

CSU-CDA-3.2.2-0010 Demonstration
FCDA and WCDA shall have the capability to point ground antennas at Metop satellites and track with sufficient accuracy to support downlink data collection [PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0020 Demonstration, Analysis
The FCDA shall have the capability to point ground antennas at Metop satellites and track with sufficient accuracy to support commanding [PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0030 Demonstration
The FCDA shall provide the capability to auto-track Metop satellite S-band, L-band and X-band downlinks [PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0040 Demonstration
The FCDA shall provide the capability to program-track during Metop satellite S-band, L-band and X-band downlinks [PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0050 Demonstration
The WCDA shall provide the capability to auto-track Metop satellite L-band downlinks [PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0060 Demonstration
The WCDA shall provide the capability to program-track during Metop satellite L-band downlinks [PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0070 Demonstration
The FCDA shall provide the capability to acquire Metop GDS X-band data in accordance with the Metop Space to Ground Interface specification [AD-16] [PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0080 Test
The FCDA and WCDA shall provide the capability to acquire MHRPT L-band data in accordance with the Metop Space to Ground Interface Specification [AD-16] [PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0090 Test
The FCDA shall provide the capability to acquire Metop TM S-band data in accordance with the Metop Space to Ground Interface Specification [AD-16] [PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0100 Test
The FCDA shall provide bit synchronization for Metop downlink streams in accordance with the Metop Space to Ground Interface Specification [AD-16] [PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0110 Test
The FCDA shall provide demodulation for Metop downlink data streams in accordance with the Metop Space to Ground Interface Specification [AD-16] [PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0120 Test
The WCDA shall provide a) bit synchronization and b) demodulation for MHRPT downlink data streams in accordance with the Metop Space to Ground Interface Specification [AD-16] [PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0130 Demonstration
The FCDA shall perform RF processing and data routing of Metop downlinked data [PGSL-3.2.2.4-110, PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0140 Demonstration
FCDA and WCDA shall perform RF processing and data routing of Metop HRPT data [PGSL-3.2.2.4-110, PCDA-3.3.1.2-010/020, PCDA-3.3.1.3-010, PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0150 Demonstration
The FCDA shall provide the capability to inject test data into the Metop S-band, L-band, and X-band acquisition chains [PCDA-3.3.1.4-030].

CSU-CDA-3.2.2-0160 Demonstration
The WCDA shall provide the capability to inject test data into the Metop L-band acquisition chain [PCDA-3.3.1.4-030].

3.2.3 Data Processing

CSU-CDA-3.2.3-0010 Demonstration
The FCDA shall provide the capability to a) frame synchronize, b) Reed-Solomon decode and de-interleave, c) VCDU error correct, and d) remove fill data from Metop GDS data [PCDA-3.3.1.1-060, PCDA-3.3.1.4-080].

CSU-CDA-3.2.3-0020 Demonstration
The FCDA shall provide the capability to append a quality flag (i.e. GOOD/BAD) to the Metop GDS data based on the Reed-Solomon information in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] PCDA-3.3.1.1-060, PCDA-3.3.1.4-080].

CSU-CDA-3.2.3-0030 Demonstration

The FCDA shall provide the capability to append a UTC time stamp to the Metop GDS data in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PCDA-3.3.1.1-060, PCDA-3.3.1.4-080].

CSU-CDA-3.2.3-0040 Test
The FCDA shall provide the capability to UTC time stamp Metop TM data in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PCDA-3.3.1.1-070, PCDA-3.3.1.4-070].

CSU-CDA-3.2.3-0050 Demonstration
FCDA and WCDA shall provide the capability to a) frame synchronize, b) viterbi decode, c) Reed-Solomon decode and d) de-interleave Metop HRPT data [PCDA-3.3.1.1-030].

CSU-CDA-3.2.3-0060 Demonstration
FCDA and WCDA shall provide the capability to extract and selected VCDUs from the MHRPT data stream [PCDA-3.3.1.1-030].

CSU-CDA-3.2.3-0070 Demonstration
FCDA and WCDA shall provide the capability to append quality flags to MHRPT VCDUs to be sent to the IPS (TBD) [PCDA-3.3.1.1-030].

3.2.4 Commanding

CSU-CDA-3.2.4-0010 Test
The FCDA shall provide the capability to encode and transmit Telecommands to Metop satellites in accordance with the Metop Space to Ground Interface specification [AD-16] [PCDA-3.3.1.1-050].

CSU-CDA-3.2.4-0020 Demonstration
The FCDA shall immediately uplink without alteration Metop Telecommands [PCDA-3.3.1.1-050].

CSU-CDA-3.2.4-0030 Demonstration
The FCDA shall provide the capability to inject test data into the Metop S-band commanding chain [PCDA-3.3.1.1-040].

CSU-CDA-3.2.4-0040 Test
The FCDA shall provide the capability to generate Metop telecommand echoes in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [[PCDA-3.3.1.1-090].

3.2.5 Archiving and Data Storage

CSU-CDA-3.2.5-0010 Demonstration
The FCDA shall provide the capability to store at least 7 days of Metop GDS data for later playback [PCDA-3.3.1.1-140.

CSU-CDA-3.2.5-0020 Demonstration
The FCDA shall provide the capability to archive Metop real-time TM. (TBD)

CSU-CDA-3.2.5-0030 Demonstration
FCDA and WCDA shall provide the capability to store Metop HRPT data for later processing and playback [PGSL-3.2.2.4-110].

CSU-CDA-3.2.5-0040 Demonstration
The FCDA shall provide the capability to retrieve and playback Metop GDS data [PCDA-3.3.1.1-140].

CSU-CDA-3.2.5-0050 Demonstration
FCDA and WCDA shall provide the ability to retrieve, playback and process Metop HRPT data [PGSL-3.2.2.4-110, PCDA-3.3.1.1-030].

CSU-CDA-3.2.5-0070 Test, Analysis
FCDA and WCDA shall provide the capability to retrieve all or selected subsets of the IJPS satellite data archived by that CDA [PCDA-3.3.1.1-100, PCDA-3.3.1.2-030/040].

CSU-CDA-3.2.5-0080 Demonstration
FCDA and WCDA shall provide the capability to generate IJPS global data tapes in accordance with DLT Standards [PCDA-3.3.1.1-100, PCDA-3.3.1.2-030].

CSU-CDA-3.2.5-0090 Demonstration
The FCDA shall provide the capability to generate GDS backlog tapes in accordance with DLT Standards [PCDA-3.3.1.2-030/040].

3.2.6 External Interfaces

CSU-CDA-3.2.6-0010 Demonstration, Analysis
FCDA and WCDA shall provide extracted MHRPT data (AVHRR, satellite telemetry and administrative messages) to the Communications Element (CE) in accordance with the CE ICD [AD-20] [PCDA-3.3.1.1-030].

CSU-CD-3.2.6-0020 Demonstration
The FCDA shall forward to the Communications Element Metop GDS data in the form of Virtual Channel Data Units (VCDU), Reed-Solomon decoded with resulting quality flag and UTC time stamp appended [PCDA-3.3.1.4-080].

CSU-CDA-3.2.6-0030 Demonstration, Analysis
The FCDA shall provide Metop TM data to the Communications Element in accordance with the CE ICD [AD-20] [PCDA-3.3.1.3-040, PCDA-3.3.1.4-070].

CSU-CDA-3.2.6-0040 Demonstration, Analysis
The FCDA shall provide the capability to time stamp and forward to the Communications Element Metop TM in real time [PCDA-3.3.1.4-070].

CSU-CDA-3.2.6-0050 Demonstration, Analysis
The FCDA shall provide Metop telecommand echoes to the Communications Element in accordance with the CE ICD [AD-20] [PCDA-3.3.1.1-090].

CSU-CDA-3.2.6-0060 Demonstration, Analysis
The FCDA shall receive Metop Telecommand data from the Communications Element in accordance with the CE ICD [AD-20] [PCDA-3.3.1.1-090].

CSU-CDA-3.2.6-0070 Demonstration
The FCDA shall provide the ability to support the restart of the Metop GDS transmission to the Suitland Single Door Interface [PGSL-3.2.2.4-060, PCDA-3.3.1.4-080].

CSU-CDA-3.2.6-0080 Demonstration, Analysis
FCDA and WCDA shall interface with other PGS elements via the Communications Element in accordance with the CE ICD [AD-20] [PCDA-3.3.1.3-030].

3.2.7 Performance

CSU-CDA-3.2.7-0010 Test
The FCDA shall provide the ability to simultaneously support data acquisition and downlink processing for one IJPS POES satellite and one Metop satellite [PGSL-3.2.2.1-010, PCDA-3.3.1.1-020/040/050/080/090, PCDA-3.3.1.3-010].

CSU-CDA-3.2.7-0020 Test
The FCDA shall provide the capability to simultaneously support data routing for one IJPS POES satellite and one Metop satellite [PGSL-3.2.2.1-010, PCDA-3.3.1.1-040/050/080/090/110/120/130/140, PCDA-3.3.1.3-040].

CSU-CDA-3.2.7-0030 Test
The FCDA shall provide the capability to simultaneously support commanding for one IJPS POES satellite and one Metop satellite [PGSL-3.2.2.1-010, PCDA-3.3.1.1-040/050/080/090].

CSU-CDA-3.2.7-0040 Test
The WCDA shall provide the capability to simultaneously support data acquisition and downlink processing for one IJPS POES satellite and for one Metop satellite (L-band only) [PGSL-3.2.2.1-010, PCDA-3.3.1.3-010].

CSU-CDA-3.2.7-0050 Test
The WCDA shall provide the capability to simultaneously support data routing for one IJPS POES satellite and MHRPT data routing and processing for one Metop satellite [PGSL-3.2.2.1-010, PCDA-3.3.1.1-030].

CSU-CDA-3.2.7-0070 Test, Analysis
The FCDA shall successfully transmit 99.8% of the Telecommand received from the Communications Element to Metop satellites over any 30-day period [PCDA-3.3.1.1-040].

CSU-CDA-3.2.7-0080 Test
FCDA and WCDA shall have the capability to generate backlog tapes containing requested archived IJPS global data within TBD of receiving the request [PCDA-3.3.1.2-030/040].

CSU-CDA-3.2.7-0090 Test
The FCDA shall time tag Metop TM data to within an accuracy of better than 100 microseconds (TBC) of UTC [PCDA-3.3.1.1-070, PCDA-3.3.1.4-070].

CSU-CDA-3.2.7-0100 Test
The FCDA shall time tag Metop GDS data to within an accuracy of better than 100 microseconds (TBC) of UTC [PCDA-3.3.1.1-060, PCDA-3.3.1.4-080].

CSU-CDA-3.2.7-0110 Test, Analysis
FCDA and WCDA shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the IJPS POES GAC acquired by that CDA to the Communications Element [PGSL-3.2.2.4-050].

CSU-CDA-3.2.7-0120 Test, Analysis
CDA performance requirement CSU-CDA-3.2.7-0110 shall be met when SAIP or STIP data is provided to the Communications Element instead of GAC data [PGSL-3.2.2.4-050].

CSU-CDA-3.2.7-0130 Test, Analysis
The FCDA shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the Metop TM acquired by that CDA to the Communications Element [PGSL-3.2.2.4-070].

CSU-CDA-3.2.7-0140 Test, Analysis
The FCDA shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the Metop GDS acquired by that CDA to the Communications Element [PGSL-3.2.2.4-060].

CSU-CDA-3.2.7-0150 Test, Analysis
FCDA and WCDA shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the Metop MHRPT VCDUs extracted by that CDA to the Communications Element [PGSL-3.2.2.4-110].

CSU-CDA-3.2.7-0160 Test, Analysis
FCDA and WCDA shall complete data processing for selected MHRPT VCDUs and delivery to the Communications Element within TBD of the completion of the frame containing that data [PGSL-3.2.2.4-110].

CSU-CDA-3.2.7-0170 Test, Analysis
TBD% of the IJPS global data sent to archive at a CDA shall be retrievable [PCDA-3.3.1.2-030/040].

3.3 Upgraded SOCC Unique Requirements

CSU-SOC-3.3-0010 Demonstration
The SOCC shall support the co-ordinations with EUMETSAT necessary to ensure the day-to-day operation of each party's respective satellites and ground segment including contingency-support and blind orbit support tasks [PGSL-3.2.2.1-010, SOC-3.3.2.2-040].

CSU-SOC-3.3-0020 Demonstration, Analysis
The SOCC shall provide the capability to support operations in accordance with the JORP [AD-14] [PGSL-3.2.2.1-010].

CSU-SOC-3.3-0030 Test, Analysis
The Backup SOCC shall provide the capability to perform SOCC operational functions necessary to maintain the health and safety of IJPS POES satellites [PSOC-3.3.2.1-025].

CSU-SOC-3.3-0050 Demonstration
The operational SOCC (SOCC or Backup SOCC) shall control the Communications Element PSOC-3.3.2.1-010/025]. (TBD)

CSU-SOC-3.3-0060 Demonstration, Analysis
The SOCC shall provide the Communications Element maintenance [PGSL-3.2.2.4-020, PSOC-3.3.2.1-010].

3.3.1 Monitor and control

CSU-SOC-3.3.1-0010 Demonstration
The SOCC shall provide the capability to configure and control SOCC hardware and software and Communications Element resources to support IJPS operations [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.1-0020 Demonstration
The Backup SOCC shall provide the capability to configure and control Backup SOCC hardware and software and Communications Element resources to support IJPS operations [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.1-0030 Demonstration
The SOCC and Backup SOCC shall provide the capability to remotely configure and control IJPS hardware and software resources at the CDAs [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.1-0040 Demonstration
The operational SOCC (SOCC or Backup SOCC) shall monitor the status and control the IJPS hardware and software resources of the CDAs [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.1-0050 Demonstration
Control of SOCC, Backup SOCC and the Communications Element hardware and software shall be through a) automated execution of the schedule and/or b) manual commands [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.1-0060 Demonstration
The SOCC and Backup SOCC shall provide IJPS operators the capability to monitor the real-time data quality of downlink acquisitions from Metop and IJPS POES satellites [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.1-0070 Demonstration
The SOCC and Backup SOCC shall provide the capability to configure PGS CDA, operational SOCC and Communication equipment including any EUMETSAT-provided unique command, telemetry acquisition and/ or data acquisition equipment to support IJPS operations [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.1-150, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.1-0080 Demonstration
The SOCC and Backup SOCC shall provide the capability to monitor the state of PGS operational SOCC, CDA, and communication equipment and links including any EUMETSAT-provided unique command, telemetry acquisition and/ or data acquisition equipment to support IJPS operations [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PCDA-3.3.1.1-150, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.1-0090 Demonstration
The SOCC and Backup SOCC shall provide the capability to start/stop/reconfigure any real time stream (data stream defined by data type, source and destination) in support of IJPS operations. [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.1-0100 Demonstration
The SOCC shall have the capability utilizing the Darmstadt Interface to monitor NOAA provided instruments on Metop Satellites [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.1-200, PSOC-3.3.2.2-010/020/030].

CSU-SOC-3.3.1-0110 Demonstration
The SOCC shall provide the capability to monitor the performance of the Suitland Interface [PGSL-3.2.2.1-010, PGSL-3.2.2.4-020, PSOC-3.3.2.3-10].

3.3.2 Reserved

3.3.3 Telemetry Processing

CSU-SOC-3.3.3-0010 Demonstration
The SOCC and Backup SOCC shall provide the capability to and process the IJPS POES satellite telemetry (TIP or AIP or HRPT) acquired and provided by EUMETSAT [PSOC - 3.3.2.1-025/150, PSOC-3.3.2.2-020].

CSU-SOC-3.3.3-0020 Demonstration, Test
In accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15], the SOCC shall provide the capability to assess in real time state-of-health telemetry data from NOAA instruments on Metop satellites [PSOC-3.3.2.1-200, PSOC-3.3.2.2-030].

CSU-SOC-3.3.3-0030 Demonstration
The SOCC and Backup SOCC shall provide the capability to simultaneously process telemetry received through EPS resources from IJPS POES satellites and telemetry received through PGS resources from POES (IJPS and pre-IJPS) satellites [PSOC-3.3.2.1-025/150, PSOC-3.3.2.2-020].

CSU-SOC-3.3.3-0040 Demonstration
The SOCC and Backup SOCC shall provide the capability to extract MHS telemetry from IJPS POES TIP, AIP, HRPT and GAC data streams [PSOC-3.3.2.1-025/180/190].

CSU-SOC-3.3.3-0050 Demonstration
The SOCC and Backup SOCC shall have the capability to manage extracted IJPS POES MHS telemetry and to provide such telemetry data to the EPS CGS [PSOC-3.3.2.1-025/180/190.

3.3.4 Trending and Analysis

CSU-SOC-3.3.4-0010 Demonstration
The SOCC and Backup SOCC shall provide the capability to monitor and assess long term trends in IJPS POES MHS parameters sufficient for anomaly detection and resolution and for nominal instrument command and control purposes [PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.4-0020 Demonstration
The SOCC shall provide the capability to assess CDA, Communications Element and the Suitland Interface quality of service for Metop blind orbit cross support [PGSL-3.2.2.4-020/060, PSOC-3.3.2.3-010, PSOC-3.3.2.4-050/060].

3.3.5 Commanding

CSU-SOC-3.3.5-0010 Demonstration
The SOCC and Backup SOCC shall provide the capability to generate, validate, authenticate, and verify IJPS POES MHS instrument commands including real time commands [PSOC-3.3.2.1-025, PSOC-3.3.2.2-020].

CSU-SOC-3.3.5-0020 Demonstration
The SOCC and Backup SOCC shall provide the capability to command MHS instruments by utilizing PGS resources [PSOC-3.3.2.1-025, PSOC-3.3.2.2-020].

CSU-SOC-3.3.5-0030 Demonstration
The SOCC and Backup SOCC shall provide the capability to command IJPS POES satellites by utilizing the commanding access provided by EUMETSAT through the EPS CGS [PSOC-3.3.2.1-020/025/130, PSOC-3.3.2.2-060].

CSU-SOC-3.3.5-0040 Demonstration
The SOCC and Backup SOCC shall provide the capability to format and transmit commands to the IJPS POES satellites via the EUMETSAT CGS in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PSOC-3.3.2.1-025/130].

CSU-SOC-3.3.5-0050 Demonstration
The SOCC and Backup SOCC shall provide the capability to ingest and process IJPS POES command echoes provided at the Darmstadt interface [PSOC-3.3.2.1-025/140].

CSU-SOC-3.3.5-0060 Test
The SOCC and Backup SOCC shall provide the capability to simultaneously command IJPS POES satellites using EPS resources and POES (IJPS and pre-IJPS) satellites using PGS resources [PSOC-3.3.2.1-025/130, PSOC-3.3.2.2-020/060].

3.3.6 Planning and Scheduling

CSU-SOC-3.3.6-0010 Demonstration
The SOCC shall provide the capability to schedule FCDA, SOCC and communication resources in support of Metop blind orbit and contingency support operations [PSOC-3.3.2.1-010/050/060/070/ 080].

CSU-SOC-3.3.6-0020 Demonstration
The SOCC and Backup SOCC shall provide the capability to schedule PGS CDA, operational SOCC, and communication resources in support of IJPS POES operations and Metop MHRPT data acquisitions [PSOC-3.3.2.1-010/020/025/040/100/110/120/130/140/150, PSOC-3.3.2.2-020].

CSU-SOC-3.3.6-0030 Demonstration
The SOCC and Backup SOCC shall provide the capability to plan and schedule for the use of EPS CGS resources for IJPS POES blind orbit cross support operations [PSOC-3.3.2.1-010/020/025/040/130/140/150, PSOC-3.3.2.2-020/040/060].

CSU-SOC-3.3.6-0040 Demonstration, Analysis
The SOCC and Backup SOCC shall provide the capability to plan and schedule communication resources in support of acquisition of Metop GDS data from the Darmstadt Interface [PSOC-3.3.2.1-025/030.

CSU-SPC-3.3.6-0050
The SOCC and Backup SOCC shall provide the capability to plan and schedule communications resources in support of acquisition of Metop IASI level 1c and GRAS, ASCAT and GOME-2 level 1b products from the Darmstadt Interface [PSOC-3.3.2.1-025/030].

CSU-SOC-3.3.6-0060 Demonstration

In accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] the operational SOCC (SOCC or Backup SOCC) shall accept inputs for planning and scheduling from EUMETSAT [PSOC-3.3.2.1-025, PSOC-3.3.2.2-040].

CSU-SOC-3.3.6-0070 Demonstration
The SOCC and Backup SOCC shall provide the capability to utilize antenna RF masks and products from the Metop state vectors to plan and schedule CSU Metop support activities [PSOC-3.3.2.1-025/030/050/060].

CSU-SOC-3.3.6-0080 Demonstration
The operational SOCC (SOCC or Backup SOCC) shall make available to EUMETSAT: 1) IJPS POES satellite orbit state vector updates (i.e., four line elements); 2) IJPS POES OBT/UTC time correlation updates and 3) other data as specified in the JORP [AD-14] [PSOC-3.3.2.1-025, PSOC-3.3.2.2-040].

CSU-SOC-3.3.6-0090 Demonstration
The SOCC and Backup SOCC shall provide the capability to create plans and schedules that include activities for the management of health and status of IJPS POES MHS instruments [PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.6-0100 Demonstration
The SOCC and Backup SOCC shall provide the capability to produce and update schedules based on IJPS space and ground asset maintenance needs [PSOC-3.3.2.1-010/020/025/030/040/050/060/070/080/090/100/110/120/130/140/150/160/170/190/210].

CSU-SOC-3.3.6-0110 Demonstration
The SOCC and Backup SOCC shall provide the capability to generate IJPS POES satellite stored command tables that include commands for MHS instruments [PSOC-3.3.1-025, PSOC3.3.2.2-010/020].

3.3.7 Report generation

CSU-SOC-3.3.7-0010 Demonstration
The SOCC and Backup SOCC shall provide the capability to generate reports used in the evaluation of PGS/IJPS performance [PGSL-3.2.2.4-020/030/040/050/060/070/080/090/100/110, PSOC-3.3.2.1-025, PSOC-3.3.2.4-020/030/040/050/060/070.

CSU-SOC-3.3.7-0020 Demonstration
The SOCC shall provide the capability to compare and report the amount of expected data frames to actual data frames received for Metop downlink acquisitions at PGS CDAs [PGSL-3.2.2.4-040/060/070/080/110, PSOC-3.3.2.4-020/050/06].

CSU-SOC-3.3.7-0030 Demonstration
The SOCC and Backup SOCC shall provide the capability to compare and report the amount of expected IJPS POES downlink data frames to actual data frames received through either PGS or EPS resources [PSOC-3.3.2.4-040].

3.3.8 Database Maintenance

CSU-SOC-3.3.8-0010 Demonstration, Analysis
The SOCC shall provide the capability to exercise version control of operational databases for IJPS satellites (POES and Metop) [PSOC-3.3.2.1-120, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.8-0020 Demonstration, Analysis
The Backup SOCC shall provide the capability to exercise version control of operational databases for IJPS POES satellite [PSOC-3.3.2.1-025/120, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.8-0030 Demonstration, Analysis
The SOCC and Backup SOCC shall provide the capability for operators to modify IJPS POES operational databases for IJPS satellites [PSOC-3.3.2.1-025/120, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.8-0040 Demonstration, Analysis
Operational databases shall support IJPS POES MHS instrument operations [PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.8-0050 Test, Analysis
The SOCC shall provide the capability to maintain constellation information on up to TBD IJPS POES satellites and 2 Metop satellites in addition to required pre-IJPS POES satellites [PSOC-3.3.2.1-120, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.8-0060 Test, Analysis
The Backup SOCC shall provide the capability to maintain constellation information on up to TBD IJPS POES satellites in addition to the required pre-IJPS POES satellites [PSOC-3.3.2.1-025/120, PSOC-3.3.2.2-010/020].

3.3.9 External Interfaces

CSU-SOC-3.3.9-0010 Demonstration
The operational SOCC (SOCC or Backup SOCC) shall provide the capability to receive from the Communications Element the IJPS POES telemetry which was acquired by EUMETSAT [PSOC-3.3.2.1-025/150, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.9-0020 Demonstration
The SOCC shall provide the capability to receive Metop ephemeris data (i.e. orbit prediction over the next 24 hours) from CEMSCS [PSOC-3.3.2.1-030/050/060].

CSU-SOC-3.3.9-0030 Demonstration
The operational SOCC (SOCC or Backup SOCC) shall receive Metop OBT/UTC time correlation updates from the EPS CGS [PGSL-3.2.2.4-110, PSOC-3.3.2.1-025, PSOC-3.3.2.2-040].

CSU-SOC-3.3.9-0040 Demonstration

The SOCC shall make requested MHS Telemetry available to EUMETSAT at the Darmstadt Interface [PSOC-3.3.2.1-190].

CSU-SOC-3.3.9-0050 Analysis, Demonstration
The SOCC shall provide IJPS POES MHS data in engineering values [PSOC-3.3.2.1-190].

CSU-SOC-3.3.9-0060 Demonstration
The MHS data shall be made available in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PSOC-3.3.2.1-190].

CSU-SOC-3.3.9-0070 Analysis, Demonstration
The SOCC and Backup SOCC shall be capable of a voice exchange with the CGS [PSOC-3.3.2.1-025, PSOC-3.3.2.2-030].

CSU-SOC-3.3.9-0080 Demonstration
The operational SOCC (SOCC and Backup SOCC) shall provide auxiliary and co-ordination data to EUMETSAT in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PSOC-3.3.2.1-025, PSOC-3.3.2.2-040].

CSU-SOC-3.3.9-0090 Demonstration
The SOCC and Backup SOCC shall receive auxiliary and co-ordination data from EUMETSAT in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] [PSOC-3.3.2.1-025, PSOC-3.3.2.2-040].

CSU-SOC-3.3.9-0100 Demonstration
The SOCC shall provide the capability to acquire one orbit buffer of IJPS POES Global data from the CGS Control Site in Darmstadt [PSOC-3.3.2.1-040].

CSU-SOC-3.3.9-0110 Demonstration
The SOCC shall provide the capability to acquire one orbit buffer of Metop GDS from the CGS Control Site in Darmstadt [PSOC-3.3.2.1-030].

3.3.10 Performance

CSU-SOC-3.3.10-0010 Test
The SOCC and Backup SOCC shall provide the capability to simultaneously command 2 IJPS POES satellites utilizing two separate CDAs [PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.10-0020 Test
The SOCC and Backup SOCC shall provide the capability to simultaneously process telemetry from 2 POES/IJPS POES satellites acquired by two separate CDAs [PSOC-3.3.2.1-025, PSOC-3.3.2.2-010/020].

CSU-SOC-3.3.10-0030 Performance, Test, Analysis
The SOCC and Backup SOCC shall provide the capability to control CDA, operational SOCC, and Communications Element resources in such manner as to ensure that 98.8% (measured over

any 30-day period) of the IJPS POES Global data acquired by the PGS is made available to the Suitland Interface in compliance with IJPS timeliness requirements [PSOC-3.3.2.1-025, PSOC-3.3.2.4-040].

CSU-SOC-3.3.10-0040 Test, Analysis
The SOCC shall provide the capability to control CDA, SOCC, and Communications Element resources in such manner as to ensure that 98.8% (measured over any 30 day period) of Metop GDS blind orbit data acquired by the FCDA is be made available at the Suitland Interface in compliance with IJPS timeliness requirements [PSOC-3.3.2.4-050].

CSU-SOC-3.3.10-0050 Test, Analysis
The SOCC shall provide the capability to control CDA, SOCC, and Communications Element resources in such manner as to ensure that 98.8% (measured over any 30 day period) of the TM downlinked by Metop to the FCDA is made available to the Suitland Interface in compliance with IJPS timeliness requirements [PSOC-3.3.2.4-060].

CSU-SOC-3.3.10-0060 Test, Analysis
The SOCC shall provide the capability to control CDA, SOCC, and Communications Element resources in such manner as to ensure that 98.8% (measured over any 30 day period) of the Metop TC provided at the Suitland Interface are successfully up-linked by the FCDA to Metop in compliance with IJPS timeliness requirements [PGSL-3.2.2.2-040].

CSU-SOC-3.3.10-0070 Test, Analysis
The SOCC and Backup SOCC shall provide the capability to reconstitute an IJPS GAC acquisition chain through a CDA to the Suitland Interface in less than 360 minutes [PSOC-3.3.2.1-025, PSOC-3.3.2.4-040].

CSU-SOC-3.3.10-0080 Test, Analysis
The SOCC shall provide the capability to reconstitute the GDS acquisition chain through the FCDA to the Suitland Interface in less than 360 minutes [PSOC-3.3.2.4-050].

CSU-SOC-3.3.10-0090 Test, Analysis
The SOCC shall provide the capability to reconstitute the Metop TM acquisition chain through the FCDA to the Suitland Interface in less than 100 minutes [PSOC-3.3.2.4-030].

CSU-SOC-3.3.10-0100 Test, Analysis
The SOCC shall provide the capability to reconstitute the Metop TC transmission chain from the Suitland Interface through the FCDA in less than 100 minutes [PSOC-3.3.2.4-030].

CSU-SOC-3.3.10-0110 Test, Analysis
The SOCC and Backup SOCC shall provide the capability to reconstitute an MHRPT acquisition chain through a CDA to the and Preprocessing System in less than 360 minutes [PGSL-3.2.2.4-110, PSOC-3.3.2.1-025].

CSU-SOC-3.3.10-0120 Test, Analysis

The SOCC and Backup SOCC shall provide the capability to control CDA, operational SOCC, and Communications Element resources in such a manner as to ensure that TBD % (measured over any 30-day period) of the MHRPT data acquired by the PGS is made available to the and Preprocessing System within timeliness requirements [PGSL-3.2.2.4-110, PSOC-3.3.2.1-025].

CSU-SOC-3.3.10-0130 Test, Analysis
The SOCC and Backup SOCC shall provide the capability to control Communications Element resources in such a manner as to ensure that 98.8% (TBC) (measured over any 30-day period) of the IJPS meteorological data acquired by the PGS is provided to AFWA (TBC) in compliance with timeliness requirements [PGSL-3.2.2.3-100, PSOC-3.3.2.1-025].

CSU-SOC-3.3.10-0140 Demonstration
The SOCC and Backup SOCC shall provide the capability to generate a conflict-free schedule for up to two IJPS POES satellites and one Metop satellite [PSOC-3.3.2.1-010/025, PSOC-3.3.2.2-010].

CSU-SOC-3.3.10-0150 Test, Analysis
In accordance with IJPS GAC timeliness requirements, the SOCC shall make available to the EPS CGS at the Suitland Interface, 99.8% (measured over any 30-day period) of the IJPS POES global data received from the Communications Element [PSOC-3.3.2.4-040].

CSU-SOC-3.3.10-0160 Test, Analysis
In accordance with GDS timeliness requirements, the SOCC shall make available to the EPS CGS at the Suitland Interface, 99.8% (measured over any 30-day period) of the Metop GDS received from the Communications Element [PSOC-3.3.2.4-050].

CSU-SOC-3.3.10-0170 Test, Analysis
In accordance with Metop telemetry timeliness requirements, the SOCC shall make available to the EPS CGS at the Suitland Interface, 99.8% (measured over any 30-day period) of the Metop telemetry received from the Communications Element [PSOC-3.3.2.4-060].

CSU-SOC-3.3.10-0180 Test, Analysis
In compliance with Metop TC timeliness requirements, the SOCC shall deliver to the Communications Element 99.8% (measured over any 30-day period) of the Metop TC received at the Suitland Interface [PGSL-3.2.2.2-040].

CSU-SOC-3.3.10-0190 Test, Analysis
The SOCC and Backup SOCC shall provide the capability to control Communications Element resources in such a manner as to ensure that TBD% (measured over a 30-day period) of the Metop IASI, GRAS, ASCAT and GOME-2 products made available at the Darmstadt Interface are transferred to the Ingest and Preprocessing System within timeliness requirements [PGSL-3.2.2.3-020].

3.3.11 Test and Training

Reliability, Dependability and Availability

CSU-SOC-3.3.11-0010 Demonstration
The SOCC's and Backup SOCC's IJPS POES satellite emulation/simulation shall have the ability to receive command echoes provided by the EPS CGS [PSOC-3.3.2.1-025/140].

4 Keywords with Definitions

Blind Orbit: Orbit that could not be acquired by the satellite nominal ground station, i.e., Fairbanks and Wallops for NOAA and EPS CDA (location Svalbard) for Metop. The reason for not being able to acquire the data include: failure scenarios, non-visibility from the ground station, cross-support for satellite operations upon request for specific operations.

Global data: IJPS global data is Metop GDS data or IJPS POES global data. IJPS POES global data can be any of the following: GAC, STIP or SAIP. GAC is provided when available but STIP or SAIP can be substituted when GAC is not available.

Pipeline Mode: Data of one orbit is continuously transmitted, processed and distributed within the time of the next orbit.

Split Mission: Data from two satellites is required to fulfill the mission of one satellite.

TBC: The qualification TBC (To Be Confirmed) associated with a statement or quantity indicates items which need to be further analyzed before a final decision. A requirement that is TBC is contractually a requirement.

TBD: The qualification TBD (To Be Determined) associated with a statement or quantity indicates items which are unknown at this time and must be determined in the future. A requirement that is TBD may not eventually remain a requirement.

TBW: Indicates a document yet to be written.

Throughput Mode: Data are transmitted without any other delay than required for the transmission itself and the data throughput IN equals the data throughput OUT.

5 Open Issues

5.1 TBC

CSU-CR-3.1.9-0070 Test, Analysis
The CSU shall have an overall system availability of 99.6% (TBC).

CSU-CR-3.1.12-0010 Test
The CSU shall deliver the first IJPS GAC data via the Communications Element to the Suitland Interface no later than 120 seconds after loss of signal. The CSU shall be allocated 119 (TBC) seconds of the 120 seconds.

CSU-CR-3.1.12-0020 Test
The CSU shall complete delivery of IJPS GAC data to the Suitland Interface no later than 100 minutes after completion of the GAC dump. The CSU shall be allocated 5999 (TBC) of the 6000 seconds.

CSU-CR-3.1.12-0050 Test
The CSU shall deliver the first Metop GDS data via the Communications Element to the Suitland Interface no later than 120 seconds after completion of the GDS dump. The CSU shall be allocated 119 (TBC) seconds of the 120 seconds.

CSU-CR-3.1.12-0060 Test
The CSU shall complete delivery of Metop GDS data to the Suitland Interface no later than 100 minutes after completion of the GDS dump. The CSU shall be allocated 5999 (TBC) of the 6000 seconds.

CSU-CR-3.1.12-0080 Test
The delay between the Metop TM frame complete acquisition at the FCDA and its delivery via the Communications Element to the Suitland Interface shall be less than 1 second. The CSU shall be allocated .75 seconds (TBC) of the 1 second.

CSU-CR-3.1.12-0100 Test
Metop TC shall be uplinked to the Metop satellite within 1 second of receipt at the Suitland Interface. The CSU shall be allocated .75 seconds (TBC) of the 1 second.

CSU-CDA-3.2.7-0090 Test
The FCDA shall time tag Metop TM data to within an accuracy of better than 100 microseconds TBC of UTC.

CSU-CDA-3.2.7-0100 Test
The FCDA shall time tag Metop GDS data to within an accuracy of better than 100 microseconds (TBC) of UTC.

CSU-SOC-3.3.10-0130 Test, Analysis
The SOCC and Backup SOCC shall provide the capability to control Communications Element resources in such a manner as to ensure that 98.8% (TBC) (measured over any 30-day period) of the IJPS meteorological data acquired by the PGS is provided to AFWA (TBC) in compliance with timeliness requirements.

5.2 TBD

AD-14 EPS/NOAA Joint Operations Rules and Procedures Reference Number, Issue Number and Date

RD-3 NOAA IJPS Communications Requirements Reference Number

RD-4 NOAA IJPS Communications Architecture Study Reference Number

RD-5 NOAA GS Interface Definition for IJPS Level) and Telecommand Data Reference Number

RD-6 NOAA Ground Segment Level 0 and Telecommand Data communications Architecture Options in the IJPS Period Reference Number

RD8 POES Ground Segment Upgrade Description for IJPS Issue Number and Date

CSU-CR-3.1.12-0130 Test, Analysis
The CSU shall ensure that TBD % (measured over any 30-day period) of the filtered MHRPT VCDUs acquired by a CDA are delivered via the Communications Element to the Ingest and Preprocessing System within timeliness requirements.

CSU-CDA-3.2.3-0070 Demonstration
FCDA and WCDA shall provide the capability to append quality flags to MHRPT VCDUs to be sent to the IPS (TBD).

CSU-CDA-3.2.5-0020 Demonstration
The FCDA shall provide the capability to archive Metop real-time TM. (TBD)

CSU-CDA-3.2.7-0080 Test
FCDA and WCDA shall have the capability to generate backlog tapes containing requested archived IJPS global data within TBD of receiving the request.

CSU-CDA-3.2.7-0160 Test, Analysis
FCDA and WCDA shall complete data processing for selected MHRPT VCDUs and delivery to the Communications Element within TBD of the completion of the frame containing that data.

CSU-CDA-3.2.7-0170 Test, Analysis
TBD% of the IJPS global data sent to archive at a CDA shall be retrievable.

CSU-SOC-3.3-0050 Demonstration
The operational SOCC (SOCC or Backup SOCC) shall control the Communications Element PSOC-3.3.2.1-010/025]. (TBD)

CSU-SOC-3.3.8-0050 Test, Analysis
The SOCC shall provide the capability to maintain constellation information on up to TBD IJPS POES satellites and 2 Metop satellites in addition to required pre-IJPS POES satellites.

CSU-SOC-3.3.8-0060 Test, Analysis
The Backup SOCC shall provide the capability to maintain constellation information on up to TBD IJPS POES satellites in addition to the required pre-IJPS POES satellites.

CSU-SOC-3.3.10-0120 Test, Analysis
The SOCC and Backup SOCC shall provide the capability to control CDA, operational SOCC, and Communications Element resources in such a manner as to ensure that TBD % (measured over any 30-day period) of the MHRPT data acquired by the PGS is made available to the Ingest and Preprocessing System within timeliness requirements.

CSU-SOC-3.3.10-0190 Test, Analysis
The SOCC and Backup SOCC shall provide the capability to control Communications Element resources in such a manner as to ensure that TBD% (measured over a 30-day period) of the Metop IASI, GRAS, ASCAT and GOME-2 products made available at the Darmstadt Interface are transferred to IPD within timeliness requirements.

5.3 TBW

AD-15 NOAA Ground Segment to EPS Ground Segment Interface Control Document

AD-20 Communications Element Interface Control Document

Appendix A. Requirements Matrix

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
	3.1 CDA/SOCC Upgrade Common Requirements						
CSU-CR-3.1-0010	The CSU shall not impact the ability of the PGS to meet existing POES System requirements.	PGSL-3.2.2.1-010		D,A			
CSU-CR-3.1-0020	The CSU shall provide at a minimum identical functionality for IJPS POES satellites as that provided for POES satellites by the POES CDAs and SOCC.	PGSL-3.2.2.1-010		D,A			
CSU-CR-3.1-0050	The CSU shall be compatible with the EUMETSAT Ground Segment regarding required data exchange.	PGSL-3.2.2.3-020/021/025/030/040/050		A,T			
CSU-CR-3.1-0060	The CSU shall support continuous, 24 hours a day, seven days a week operations.	PGSL-3.2.2.1-010		D.A			
CSU-CR-3.1-0070	The CSU shall provide tools necessary for a trained operator to accomplish allocated tasks within allocated time and system performance requirements.	PSYS-3.1.4-020 PGSL-3.2.2.1-010		D.A			
CSU-CR-3.1-0100	The CSU shall support IJPS POES split mission operations.	PCDA-3.3.1.1-040/050/080/090/120 PCDA-3.3.1.1-110 PSOC-3.3.2.1-020/040/130/140/150/170/180/190		A			
CSU-CR-3.1-0110	The CSU shall support IJPS operations, backlog processing, reprocessing, validation processing, and system test (IJPS and PGS).	PGSL-3.2.2.2-010/030 PCDA-3.3.1.2-020/030/040		D,A		I	
	3.1.1 Monitor and control						
CSU-CR-3.1.1-0010	CSU shall not degrade the current SOCC and CDA system capabilities to protect data, software and processes against destruction, denial of service, unauthorized modification and disclosure to unauthorized individuals.	PGSL-3.2.2.1-010		A			
CSU-CR-3.1.1-0020	CSU system modifications relating to control, monitoring, and reporting shall be integrated into the existing CDA/SOCC POES baseline system.	PGSL-3.2.2.1-010		D			
CSU-CR-3.1.1-0030	The CSU shall provide the capability for operators to monitor new equipment configurations used in support of IJPS satellites.	PGSL-3.2.2.4-020 PCDA-3.3.1.2-020/030 PCDA-3.3.1.4-030		D			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-CR-3.1.1-0040	The CSU shall provide the capability for operators to monitor schedule execution in support of IMetop satellites and new IJPS POES satellite activities.	PGSL-3.2.2.1-010 PDCA-3.3.1.1-020/025/050 PCDA-3.3.1.2-020 PSOC-3.3.2.1-010/030/040/050/060/070/080/090/100/110/130/150/160/170/090/210		D			
CSU-CR-3.1.1-0050	The CSU shall provide the capability to monitor operational status of hardware, equipment, software, internal networks and external networks, used to support IJPS satellites.	PGSL-3.2.2.4-020 PCDA-3.3.1.2-020 PCDA-3.3.1.4-030 PSOC-3.3.2.1-030		D			
CSU-CR-3.1.1-0060	The CSU shall provide the capability to detect and notify operators of frame data errors, frame losses, and sync losses in a) Metop satellite telemetry, b) Metop GDS data streams, and c) MHRPT data. Received at the PGS CDAs	PGSL-3.2.2.4-020/060/070 PCDA-3.3.1.2-020 PCDA-3.3.1.4-030 PSOC-3.3.2.1-030		D			
CSU-CR-3.1.1-0070	The CSU shall provide the capability to notify operators of an out of nominal condition for hardware and software resources delivered by the CSU development.	PGSL-3.2.2.4-020 PCDA-3.3.1.2-020 PCDA-3.3.1.4-030 PSOC-3.3.2.1-030		D			
CSU-CR-3.1.1-0080	The CSU shall provide the capability to point ground antennas at and track Metop satellites to support commanding and downlink collection.	PCDA-3.3.1.1-020/025/050 PCDA-3.3.1.2-020 PSOC-3.3.2.1-050/060/080		D			
	3.1.2 Commanding and Telemetry processing						
CSU-CR-3.1.2-0010	Metop TC shall pass through the CSU in a throughput mode from the Suitland Interface.	PGSL-3.2.2.2-040 PCDA-3.3.1.1-040/050		D			
CSU-CR-3.1.2-0020	Metop telemetry shall pass through the CSU in a throughput mode to the Suitland Interface.	PGSL-3.2.2.2-040		D			
CSU-CR-3.1.2-0030	FCDA, WCDA and the SOCC shall provide the capability to monitor the health and status of IJPS POES MHS instruments in real time.	PSOC-3.3.2.1-025/180/190		D			
CSU-CR-3.1.2-0040	FDCA, WCDA and the SOCC shall be able to ingest, decommutate, archive and trend IJPS POES MHS telemetry	PSOC-3.3.2.1-025/180/190		D			
	3.1.3 Data Storage						
CSU-CR-3.1.3-0010	The CSU shall provide the capability to associate attributes with each piece of Metop recorded and archived data to include at a minimum: a) date and time, b) data identifier, c) satellite, d) orbit number.	PGSL-3.2.2.1-010 PCDA-3.3.2.1-030/040 PCDA-3.3.1.4-020		D			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-CR-3.1.3-0020	The CSU shall provide the capability to retrieve recorded and archived IJPS data by data identifier and the following sort criteria, at a minimum: a) date and time, b) satellite, c) orbit number.	PGSL-3.2.2.1-010 PCDA-3.3.2.1-030/040		D			
	3.1.4 Anomalies and Contingency						
CSU-CR-3.1.4-0020	The CSU shall provide the capability to recognize and continue operations in the event that IJPS POES data received from the Suitland Interface is corrupt (e.g. corrupted at source), is duplicated (e.g. downlinked twice), is out of time sequence, is incomplete, or is missing (e.g. between passes).	PGSL-3.2.2.1-010 PSOC-3.3.2.1-010/040/150/160/170/190/210		T			
CSU-CR-3.1.4-0030	The CSU shall provide operators the capability to direct the failover to redundant CSU equipment and interfaces in the event of failure of on-line equipment or interfaces.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDS-3.3.1.2-020 PCDA-3.3.1.4-030 PSOC-3.3.2.1-020/030/040/050		D			
CSU-CR-3.1.4-0040	The CSU shall provide capabilities which aid in detecting, diagnosing and resolving anomalies in the IJPS POES MHS instruments.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDA-3.3.1.2-010 PCDA-3.3.1.4-030		D,A			
CSU-CR-3.1.4-0050	The CSU shall provide capabilities which aid in detecting, diagnosing and resolving anomalies in CSU ground resources.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDA-3.3.1.4-030		D,A			
CSU-CR-3.1.4-0060	The CSU shall provide support to the investigation and response to in-orbit anomalies and emergency situations related to the NOAA-provided instruments on Metop satellites.	PCDA-3.3.1.1-080 PSOC-3.3.2.1-50/60/120/200		D,A			
	3.1.5 Operational Requirements						
CSU-CR-3.1.5-0010	The CSU shall be capable of providing support to Metop satellite operations upon the successful completion of the System Commissioning Review (SCR) for that Metop satellite.	PCDA-3.3.1.2-010 PSOC-3.3.2.2-010		D.A			
CSU-CR-3.1.5-0020	The CSU shall be capable of supporting IJPS POES satellite operations upon the successful completion of the On-orbit Verification Review for that POES satellite.	PCDA-3.3.1.2-010 PSOC-3.3.2.2-010		D.A			
CSU-CR-3.1.5-0030	The CSU shall provide the capability to support Early Orbit testing of IJPS POES Satellites simultaneously with normal IJPS operations.	PGSL-3.2.2.4-020 PGLS-3.2.2.1-010		D,A			
CSU-CR-3.1.5-0040	The CSU shall provide the capability to support IJPS POES satellite pre-launch activities simultaneously with normal IJPS operations.	PGSL-3.2.2.4-020 PGLS-3.2.2.1-010		D,A			
CSU-CR-3.1.5-0050	The CSU shall provide the capability to support IJPS POES satellite commissioning activities simultaneously with normal IJPS operations.	PGSL-3.2.2.4-020 PGLS-3.2.2.1-010		D,A			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-CR-3.1.5-0060	For instruments provided by NOAA to Metop 1 and 2, the CSU shall provide the ability to support Metop post launch checkout, commissioning and operations.	PIP-6.2,Item 3 PIP-5.2.2		D,A			
CSU-CR-3.1.5-0070	The CSU shall provide the capability to complete the transfer of IJPS Satellite Global data (GAC/STIP/SAIP, GDS) for orbit N, via the Communications Element, to the Suitland Interface prior to the start of pre-pass activities for Orbit N+1.	PGSL-3.2.2.1-190 PCDA-3.3.1.1-120 PSOC-3.3.2.1-210		D,A			
	3.1.6 Test and V&V Support						
CSU-CR-3.1.6-0010	All necessary test points shall be provided within the CSU that are required to perform in a repeatable fashion the integration, verification and acceptance of the CSU.	PGSL-3.2.2.1-010 PGSL-3.2.2.2-010/30 PGSL-3.2.2.3-020/050		A			
CSU-CR-3.1.6-0020	All necessary data injection points shall be provided within the CSU to perform in a repeatable fashion the integration, verification and acceptance of the CSU and to support space vehicle testing.	PGSL-3.2.2.1-010 PGSL-3.2.2.2-010/30 PGSL-3.2.2.3-020/050		A			
	3.1.7 External Interfaces						
CSU-CR-3.1.7-0010	The CSU shall deliver data to the Suitland Interface in formats in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PGSL-3.2.2.3-020/030		T			
CSU-CR-3.1.7-0020	The CSU (in conjunction with the Communications Element) shall make NOAA IJPS POES Global data available to the Suitland Interface in a manner that allows such data to be transmitted in pipeline mode to EUMETSAT.	PGSL-3.2.2.3-020/030		D,A			
CSU-CR-3.1.7-0030	The CSU (in conjunction with the Communications Element) shall make Metop GDS data available to the Suitland Interface in pipeline mode.	PGSL-3.2.2.3-020/030		D			
CSU-CR-3.1.7-0060	If GAC data is unavailable from an IJPS POES satellite, the CSU shall provide CDA acquired Stored AIP (SAIP) or Stored TIP (STIP) at the Suitland interface.	PGSL-3.2.2.1-070/150/160 PCDA-3.3.1.4-090 PSOC-3.3.2.1-070/160		D			
	3.1.8 Maintainability						
CSU-CR-3.1.8-0010	The CSU upgrades shall be maintainable over the IJPS lifetime.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-CR-3.1.8-0020	It shall be possible to perform failure investigation (e.g., H/W, S/W and communication investigations) in parallel with but, without detrimental impact on, normal operations.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A,I			
CSU-CR-3.1.8-0030	It shall be possible to perform hardware and software maintenance activities on the CSU in parallel with, but without detrimental impact on, operational activities.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A,I			
CSU-CR-3.1.8-0040	It shall be possible to release a new version of any configuration controlled CSU item without detrimental impact on the availability of the PGS.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A,I			
CSU-CR-3.1.8-0050	CSU hardware shall be developed and selected such that maintenance can be performed on site.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		D,A,I			
CSU-CR-3.1.8-0060	The CSU shall provide on-line help to operators for any new or modified software.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		D			
	3.1.9 Reliability, Dependability and Availability						
CSU-CR-3.1.9-0010	The CSU shall provide diagnostics and system configuration programs for fault detection (failure and degradation), fault isolation, indication alarms and control necessary to meet reliability and availability requirements.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		D,A,I			
CSU-CR-3.1.9-0020	Automated and/or manual diagnostics to isolate faults to the LRU shall be provided for all CSU installed equipment.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		D,A			
CSU-CR-3.1.9-0030	The downtime of the CSU IJPS GAC acquisition chain from a CDA antenna to the Suitland Interface shall not exceed 360 minutes.	PGSL-3.2.2.4-080		A			
CSU-CR-3.1.9-0040	The downtime of the CSU Metop GDS acquisition chain from the FCDA antenna to the Suitland Interface shall not exceed 360 minutes.	PGSL-3.2.2.4-080		A			
CSU-CR-3.1.9-0050	The downtime of the CSU Metop TM acquisition chain from the FCDA antenna to the Suitland Interface shall not exceed 100 minutes.	PGSL-3.2.2.2-040		A			
CSU-CR-3.1.9-0060	The downtime of the CSU Metop TC transmission chain from the Suitland Interface through the FCDA antenna shall not exceed 100 minutes.	PGSL-3.2.2.4-090		A			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-CR-3.1.9-0070	The CSU shall have an overall system availability of 99.6% (TBC).	PGSL-3.2.2.4-020		T,A			
CSU-CR-3.1.9-0080	The downtime of the CSU MHRPT acquisition chain from a CDA antenna to the and Preprocessing system shall not exceed 360 minutes.	PGSL-3.2.2.4-110		A			
	3.1.10 Design						
CSU-CR-3.1.10-0010	CSU delivered hardware shall be capable of interfacing with existing PGS hardware.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0020	CSU hardware equipment, operating system and COTS software shall be selected from product families: 1) whose availability is ensured over the IJPS PGS lifetime. 2) that ensure upward compatibility between the successive versions of a given product.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0030	The CSU hardware shall be developed or selected to be supportable or upgradable over the IJPS PGS design life.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0040	The CSU software shall be developed or selected to be supportable or upgradable over the IJPS PGS design life	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0050	Each of the CSU subelements shall offer the necessary level of modularity to allow system functional or performance evolutions with limited impact on the system design.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0060	The CSU hardware design shall support the update of operational hardware without disruptions to mission functions that exceed IJPS reliability, availability and dependability requirements	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0070	Hardware delivered by the CSU development shall not increase CDA and SOCC facility thermal and humidity control requirements	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A,I			
CSU-CR-3.1.10-0080	New CSU equipment shall be sized with 50% computer reserve capacity for input/output and processor computing throughput during any period of peak load conditions.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A,T			
CSU-CR-3.1.10-0090	New CSU equipment shall provide sufficient disk storage to meet CSU IJPS requirements with 50% reserve.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A			
CSU-CR-3.1.10-0100	The CSU LANs shall provide sufficient bandwidth to meet CSU IJPS requirements with 50% reserve.	PGSL-3.2.2.4-020 PCDA-3.3.1.4-030/040		A,T			
	3.1.11 Reserved						

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
	3.1.12 Performance						
CSU-CR-3.1.12-0010	The CSU shall deliver the first IJPS GAC data via the Communications Element to the Suitland Interface no later than 120 seconds after loss of signal. The CSU shall be allocated 119 (TBC) seconds of the 120 seconds.	PGSL-3.2.2.4-030		T			
CSU-CR-3.1.12-0020	The CSU shall complete delivery of IJPS GAC data to the Suitland Interface no later than 100 minutes after completion of the GAC dump. The CSU shall be allocated 5999 (TBC) of the 6000 seconds.	PGSL-3.2.2.4-030		T			
CSU-CR-3.1.12-0040	During split mission operation the CSU shall provide the capability to process and deliver to the Suitland Interface any of the following with the same performance as during nominal operations. a) 2 orbits of GAC b) 1 orbit GAC and 1 orbit of SAIP c) 1 orbit GAC and 1 orbit of STIP d) 2 orbits of SAIP e) 1 orbit of SAIP and 1 orbit of STIP f) 2 orbits of STIP	PCDA-3.3.1.1-110 PSOC-3.3.2.1-170		T			
CSU-CR-3.1.12-0050	The CSU shall deliver the first Metop GDS data via the Communications Element to the Suitland Interface no later than 120 seconds after completion of the GDS dump. The CSU shall be allocated 119 (TBC) seconds of the 120 seconds.	PGSL-3.2.2.4-040		T			
CSU-CR-3.1.12-0060	The CSU shall complete delivery of Metop GDS data to the Suitland Interface no later than 100 minutes after completion of the GDS dump. The CSU shall be allocated 5999 (TBC) of the 6000 seconds.	PGSL-3.2.2.4-040		T			
CSU-CR-3.1.12-0080	The delay between the Metop TM frame complete acquisition at the FCDA and its delivery via the Communications Element to the Suitland Interface shall be less than 1 second. The CSU shall be allocated .75 seconds (TBC) of the 1 second.	PGSL-3.2.2.4-070		T			
CSU-CR-3.1.12-0100	Metop TC shall be uplinked to the Metop satellite within 1 second of receipt at the Suitland Interface. The CSU shall be allocated .75 seconds (TBC) of the 1 second.	PGSL-3.2.2.2-040		T			
CSU-CR-3.1.12-0118	The CSU shall complete delivery to the Ingest and Preprocessing System via the Communications Element of filtered MHRPT VCDUs data within TBD of sensing.	PGSL-3.2.2.4-110		T,A			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-CR-3.1.12-0130	The CSU shall ensure that TBD % (measured over any 30-day period) of the filtered MHRPT VCDUs are delivered via the Communications Element to the Ingest and Preprocessing System within timeliness requirements.	PGSL-3.2.2.4-110		T,A			
CSU-CR-3.1.12-0140	CSU performance requirements (CSU-CR-3.1.12-0010, CSU-CR-3.1.12-0020, CSU-CR-3.1.12-0030, CSU-CR-3.1.12-0040) shall be met when SAIP or STIP data is provided to the Suitland interface instead of GAC data.	PGSL-3.2.2.1-070		T,A			
CSU-CR-3.1.12-0150	The CSU shall provide the capability to support one operational Metop satellite at a time.	PGSL-3.2.2.1-120 PCDA-3.3.1.1-080 PSOC-3.3.2.1-120		A			
	3.2 Upgraded CDA Unique Requirements						
CSU-CDA-3.2-0010	FCDA and WCDA shall provide the capability to carry out all necessary pre-pass, pass and post past CDA activities for Metop and IJPS POES satellites.	PGSL-3.2.2.1-010 PCDA-3.3.1.1-020/030/040/050		D,A			
	3.2.1 Monitor and Control						
CSU-CDA-3.2.1-0010	FCDA and WCDA shall provide the capability to locally configure and control IJPS CDA hardware and software.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDA--3.3.1.2-010 PCDA-3.3.1.4-030/040		D			
CSU-CDA-3.2.1-0020	Local control of the new CSU hardware and software shall be through a) local automated execution of the schedule and/or b) manual commands.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDA--3.3.1.2-010 PCDA-3.3.1.4-030/040		D			
CSU-CDA-3.2.1-0030	FCDA and WCDA shall provide the capability to override automated sequences.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDA-3.3.1.2-010 PCDA-3.3.1.4-030/040		D			
CSU-CDA-3.2.1-0050	FCDA and WCDA shall provide the capability to configure and control local CDA antennas for IJPS support.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDA-3.3.1.2-010 PCDA-3.3.1.4-030/040		D			
CSU-CDA-3.2.1-0060	FCDA and WCDA shall provide the capability to configure and control local IJPS RF equipment for Metop support.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDA--3.3.1.2-010 PCDA-3.3.1.4-030/040		D			
CSU-CDA-3.2.1-0070	FCDA and WCDA shall provide the ability to reconfigure CSU hardware during IJPS satellite contacts.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDA--3.3.1.2-010 PCDA-3.3.1.4-030/040		D			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-CDA-3.2.1-0080	FCDA and WCDA shall provide the capability to locally monitor IJPS hardware and software resources.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDA--3.3.1.2-010 PCDA-3.3.1.4-030/040		D,A			
CSU-CDA-3.2.1-0090	FCDA and WCDA shall provide the capability to monitor CDA operations in support of IJPS.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDA-3.3.1.2-010 PCDA-3.3.1.4-030/040		D			
CSU-CDA-3.2.1-0100	FCDA and WCDA shall provide the capability to monitor the data quality of downlink acquisitions from Metop satellites.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDA--3.3.1.2-010 PCDA-3.3.1.4-030/040		D,A			
	3.2.2 Data acquisition						
CSU-CDA-3.2.2-0010	FCDA and WCDA shall have the capability to point ground antennas at Metop satellites and track with sufficient accuracy to support downlink data collection.	PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		D			
CSU-CDA-3.2.2-0020	The FCDA shall have the capability to point ground antennas at Metop satellites and track with sufficient accuracy to support commanding.	PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		D			
CSU-CDA-3.2.2-0030	The FCDA shall provide the capability to auto-track Metop satellite S-band, L-band and X-band downlinks.	PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		D			
CSU-CDA-3.2.2-0040	The FCDA shall provide the capability to program-track during Metop satellite S-band, L-band and X-band downlinks.	PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		D			
CSU-CDA-3.2.2-0050	The WCDA shall provide the capability to auto-track Metop satellite L-band downlinks.	PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		D			
CSU-CDA-3.2.2-0060	The WCDA shall provide the capability to program-track during Metop satellite L-band downlinks.	PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		D			
CSU-CDA-3.2.2-0070	The FCDA shall provide the capability to acquire Metop GDS X-band data in accordance with the Metop Space to Ground Interface specification [AD-16].	PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		D			
CSU-CDA-3.2.2-0080	The FCDA and WCDA shall provide the capability to acquire MHRPT L-band data in accordance with the METOP Space to Ground Interface Specification [AD-16].	PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		T			
CSU-CDA-3.2.2-0090	The FCDA shall provide the capability to acquire Metop TM S-band data in accordance with the Metop Space to Ground Interface Specification [AD-16].	PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		T			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-CDA-3.2.2-0100	The FCDA shall provide bit synchronization for Metop downlink streams in accordance with the Metop Space to Ground Interface Specification [AD-16}.	PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		T			
CSU-CDA-3.2.2-0110	The FCDA shall provide demodulation for Metop downlink data streams in accordance with the Metop Space to Ground Interface Specification [AD-16].	PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		T			
CSU-CDA-3.2.2-0120	The WCDA shall provide a) bit synchronization and b) demodulation for MHRPT downlink data streams in accordance with the Metop Space to Ground Interface Specification [AD-16].	PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		T			
CSU-CDA-3.2.2-0130	The FCDA shall perform RF processing and data routing of Metop downlinked data.	PGSL-3.2.2.4-110 PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		D			
CSU-CDA-3.2.2-0140	FCDA and WCDA shall perform RF processing and data routing of Metop HRPT data.	PGSL-3.2.2.4-110 PCDA-3.3.1.2-010/020 PCDA-3.3.1.3-010 PCDA-3.3.1.4-030		D			
CSU-CDA-3.2.2-0150	The FCDA shall provide the capability to ingest test data into the Metop S-band, L-band, and X-band acquisition chains.	PCDA-3.3.1.4-030		D			
CSU-CDA-3.2.2-0160	The WCDA shall provide the capability to ingest test data into the Metop L-band acquisition chain.	PCDA-3.3.1.4-030		D			
	3.2.3 Data Processing						
CSU-CDA-3.2.3-0010	The FCDA shall provide the capability to a) frame synchronize, b)Reed-Solomon decode and de-interleave, c)VCDU error correct, and d) remove fill data from Metop GDS data.	PCDA-3.3.1.1-020/060 PCDA-3.3.1.4-080		D			
CSU-CDA-3.2.3-0020	The FCDA shall provide the capability to append a quality flag (i.e. GOOD/BAD) to the Metop GDS data based on the Reed - Solomon information in accordance with the NOAA Ground Segment to EDS Ground Segment ICD [AD-15].	PCDA-3.3.1.1-060 PCDA-3.3.1.4-080		D			
CSU-CDA-3.2.3-0030	The FCDA shall provide the capability to append a UTC time stamp to the Metop GDS data in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PCDA-3.3.1.1-060 PCDA-3.3.1.4-080		D			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-CDA-3.2.3-0040	The FCDA shall provide the capability to UTC time stamp Metop TM data in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PCDA-3.3.1.1-070 PCDA-3.3.1.4-070		T			
CSU-CDA-3.2.3-0050	FCDA and WCDA shall provide the capability to a) frame synchronize, b) viterbi decode, c) Reed-Solomon decode and d) de-interleave Metop HRPT data.	PCDA-3.3.1.1-030		D			
CSU-CDA-3.2.3-0060	FCDA and WCDA shall provide the capability to extract selected VCDUs from the MHRPT data stream.	PCDA-3.3.1.1-030		D			
CSU-CDA-3.2.3-0070	FCDA and WCDA shall provide the capability to append quality flags to MHRPT VCDUs to be sent to the IPS (TBD).	PCDA-3.3.1.1-030		D			
	3.2.4 Commanding						
CSU-CDA-3.2.4-0010	The FCDA shall provide the capability to encode and transmit Telecommands to Metop satellites in accordance with the Metop Space to Ground Interface specification [AD-16].	PCDA-3.3.1.1-050		T			
CSU-CDA-3.2.4-0020	The FCDA shall immediately uplink without alteration Metop Telecommands.	PCDA-3.3.1.1-050		D			
CSU-CDA-3.2.4-0030	The FCDA shall provide the capability to inject test data into the Metop S-band commanding chain.	PCDA-3.3.1.1-040		D			
CSU-CDA-3.2.4-0040	The FCDA shall provide the capability to generate Metop telecommand echoes in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PCDA-3.3.1.1-090		T			
	3.2.5 Archiving and Data Storage						
CSU-CDA-3.2.5-0010	The FCDA shall provide the capability to store at least 7 days of Metop GDS data for later playback.	PCDA-3.3.1.1-140		D			
CSU-CDA-3.2.5-0020	The FCDA shall provide the capability to archive Metop real-time TM. (TBD)			D			
CSU-CDA-3.2.5-0030	FCDA and WCDA shall provide the capability to store Metop HRPT data for later processing and playback.	PGSL-3.2.2.4-110		D			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-CDA-3.2.5-0040	The FCDA shall provide the capability to retrieve and playback Metop GDS data.	PCDA-3.3.1.1-140		D			
CSU-CDA-3.2.5-0050	FCDA and WCDA shall provide the ability to retrieve, playback and process Metop HRPT data.	PGSL-3.2.2.4-110 PCDA-3.3.1.1-030		D			
CSU-CDA-3.2.5-0070	FCDA and WCDA shall provide the capability to retrieve all or selected subsets of the IJPS satellite data archived by that CDA.	PCDA-3.3.1.1-100 PCDA-3.3.1.2-030/040		T,A			
CSU-CDA-3.2.5-0080	FCDA and WCDA shall provide the capability to generate GAC backlog tapes in accordance with DLT Standards.	PCDA-3.3.1.1-100 PCDA-3.3.1.2-030		D			
CSU-CDA-3.2.5-0090	The FCDA shall provide the capability to generate IJPS global data tapes in accordance with DLT Standards.	PCDA-3.3.1.2-030/040		D			
	3.2.6 External Interfaces						
CSU-CDA-3.2.6-0010	FCDA and WCDA shall provide extracted MHRPT data (AVHRR, satellite telemetry and administrative messages) to the Communications Element in accordance with the CE ICD [AD-20].	PCDA-3.3.1.1-030		D,A			
CSU-CD-3.2.6-0020	The FCDA shall forward to the Communications Element Metop GDS data in the form of Virtual Channel Data Units (VCDU), Reed-Solomon decoded with resulting quality flag and UTC time stamp appended.	PCDA-3.3.1.4-080		D			
CSU-CDA-3.2.6-0030	The FCDA shall provide Metop TM data to the Communications Element in accordance with the CE ICD [AD-20].	PCDA-3.3.1.3-040 PCDA-3.3.1.4-070		D,A			
CSU-CDA-3.2.6-0040	The FCDA shall provide the capability to time stamp and forward to the Communications Element Metop TM in real time.	PCDA-3.3.1.4-070		D,A			
CSU-CDA-3.2.6-0050	The FCDA shall provide Metop telecommand echoes to the Communications Element in accordance with the CE ICD (AD-20).	PCDA-3.3.1.1-090		D,A			
CSU-CDA-3.2.6-0060	The FCDA shall receive Metop Telecommand data from the Communications Element in accordance with the CE ICD [AD-20].	PCDA-3.3.1.1-040		D.A			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-CDA-3.2.6-0070	The FCDA shall provide the ability to support the restart of the Metop GDS transmission to the Suitland Single Door Interface.	PGSL-3.2.2.4-060 PCDA-3.3.1.4-080		D			
CSU-CDA-3.2.6-0080	FCDA and WCDA shall interface with other PGS elements via the Communications Element in accordance with the CE ICD [AD-20].	PCDA-3.3.1.3-030		D.,A			
	3.2.7 Performance						
CSU-CDA-3.2.7-0010	The FCDA shall provide the ability to simultaneously support data acquisition and downlink processing for one IJPS POES satellite and one Metop satellite.	PGSL-3.2.2.1-010 PCDA-3.3.1.1-020/040/050/080/090 PCDA-3.3.1.3-010		T			
CSU-CDA-3.2.7-0020	The FCDA shall provide the capability to simultaneously support data routing for one IJPS POES satellite and one Metop satellite.	PGSL-3.2.2.1-010 PCDA-3.3.1.1-040/050/080/090/110/120/130/140 PCDA-3.3.1.3-040		T			
CSU-CDA-3.2.7-0030	The FCDA shall provide the capability to simultaneously support commanding for one IJPS POES satellite and one Metop satellite.	PGSL-3.2.2.1-010 PCDA-3.3.1.1-040/050/080/090		T			
CSU-CDA-3.2.7-0040	The WCDA shall provide the capability to simultaneously support data acquisition and downlink processing for one IJPS POES satellite and for one Metop satellite (L-band only).	PGSL-3.2.2.1-010 PCDA-3.3.1.3-010		T			
CSU-CDA-3.2.7-0050	The WCDA shall provide the capability to simultaneously support data routing for two IJPS POES satellites and MHRPT data routing and processing for one Metop satellite.	PGSL-3.2.2.1-010 PCDA-3.3.1.1-030		T			
CSU-CDA-3.2.7-0070	The FCDA shall successfully transmit 99.8% of the Telecommand received from the Communications Element to Metop satellites over any 30-day periods.	PCDA-3.3.1.1-040		T,A			
CSU-CDA-3.2.7-0080	FCDA and WCDA shall have the capability to generate backlog tapes containing requested archived IJPS global data within TBD of receiving the request.	PCDA-3.3.1.2-030/040		T,A			
CSU-CDA-3.2.7-0090	The FCDA shall time tag Metop TM data to within an accuracy of better than 100 microseconds TBC of UTC.	PCDA-3.3.1.1-070 PCDA-3.3.1.4-070		T			
CSU-CDA-3.2.7-0100	The FCDA shall time tag Metop GDS data to within an accuracy of better than 100 microseconds (TBC) of UTC.	PCDA-3.3.1.1-060 PCDA-3.3.1.4-080		T			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-CDA-3.2.7-0110	FCDA and WCDA shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the IJPS POES GAC acquired by that CDA to the Communications Element.	PGSL-3.2.2.4-050		T,A			
CSU-CDA-3.2.7-0120	CDA performance requirement CSU-CDA-3.2.7-0110 shall be met when SAIP or STIP data is provided to the Communications Element instead of GAC data.	PGSL-3.2.2.4-050		T,A			
CSU-CDA-3.2.7-0130	The FCDA shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the Metop TM acquired by that CDA to the Communications Element.	PGSL-3.2.2.4-070		T,A			
CSU-CDA-3.2.7-0140	The FCDA shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the Metop GDS acquired by that CDA to the Communications Element.	PGSL-3.2.2.4-060		T,A			
CSU-CDA-3.2.7-0150	FCDA and WCDA shall deliver within timeliness requirements 99.8% (measured over any 30-day period) of the Metop MHRPT VCDUs extracted by that CDA to the Communications Element.	PGSL-3.2.2.4-110		T,A			
CSU-CDA-3.2.7-0160	FCDA and WCDA shall complete data processing for selected MHRPT VCDUs and delivery to the Communications Element within TBD of the completion of the frame containing that data.	PGSL-3.2.2.4-110		T,A			
CSU-CDA-3.2.7-0170	TBD% of the IJPS global data sent to archive at a CDA shall be retrievable.	PCDA-3.3.1.2-030/040		T,A			
	3.3 Upgraded SOCC Unique Requirements						
CSU-SOC-3.3-0010	The SOCC shall support the co-ordinations with EUMETSAT necessary to ensure the day-to-day operation of each party's respective satellites and ground segment including contingency-support and blind orbit support tasks.	PGSL-3.2.2.1-010 PSOC 3.3.2.2.-040		D			
CSU-SOC-3.3-0020	The SOCC shall provide the capability to support operations in accordance with the JORP [AD-14].	PGSL-3.2.2.1-010		D,A			
CSU-SOC-3.3-0030	The Backup SOCC shall provide the capability to perform SOCC operational functions necessary to maintain the health and safety of IJPS POES satellites.	PSOC-3.3.2.1-025		D,A			
CSU-SOC-3.3-0050	The operational SOCC (SOCC or Backup SOCC) shall control the Communications Element. (TBD)	PSOC-3.3.2.1-010/025		D			
CSU-SOC-3.3-0060	The SOCC shall provide the Communications Element maintenance.	PGSL-3.2.2.4-020 PSOC-3.3.2.1-010		D,A			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
	3.3.1 Monitor and Control						
CSU-SOC-3.3.1-0010	The SOCC shall provide the capability to configure and control SOCC hardware and software and Communications Element resources to support IJPS operations..	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.2-010/020		D			
CSU-SOC-3.3.1-0020	The Backup SOCC shall provide the capability to configure and control Backup SOCC hardware and software and Communications Element resources to support IJPS operations.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		D			
CSU-SOC-3.3.1-0030	The SOCC and Backup SOCC shall provide the capability to remotely configure and control IJPS hardware and software resources at the CDAs.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		D			
CSU-SOC-3.3.1-0040	The operational SOCC (SOCC or Backup SOCC) shall monitor the status and control the IJPS hardware and software resources of the CDAs.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		D			
CSU-SOC-3.3.1-0050	Control of SOCC, Backup SOCC and the Communications Element hardware and software shall be through a) automated execution of the schedule and/or b) manual commands.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		D			
CSU-SOC-3.3.1-0060	The SOCC and Backup SOCC shall provide IJPS operators the capability to monitor the data quality of downlink acquisitions from Metop and IJPS POES satellites.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		D			
CSU-SOC-3.3.1-0070	The SOCC and Backup SOCC shall provide the capability to configure PGS CDA, operational SOCC and Communication equipment including any EUMETSAT-provided unique command, telemetry acquisition and/ or data acquisition equipment to support IJPS operations.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDA-3.3.1.1-150 PSOC-3.3.2.2-010/020		D			
CSU-SOC-3.3.1-0080	The SOCC and Backup SOCC shall provide the capability to monitor the state of PGS operational SOCC, CDA, and communication equipment and links including any EUMETSAT-provided unique command, telemetry acquisition and/ or data acquisition equipment to support IJPS operations.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PCDA-3.3.1.1-150 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		D			
CSU-SOC-3.3.1-0090	The SOCC and Backup SOCC shall provide the capability to start/stop/reconfigure any real time stream (data stream defined by data type, source and destination) in support of IJPS operations.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		D			
CSU-SOC-3.3.1-0100	The SOCC shall have the capability utilizing the Darmstadt Interface to monitor NOAA provided instruments on Metop Satellites.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.1-200 PSOC-3.3.2.2-010/020/030		D			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-SOC-3.3.1-0110	The SOCC shall provide the capability to monitor the performance of the Suitland Interface.	PGSL-3.2.2.1-010 PGSL-3.2.2.4-020 PSOC-3.3.2.3-10		D,A			
	3.3.3 Telemetry Processing						
CSU-SOC-3.3.3-0010	The SOCC and Backup SOCC shall provide the capability to and process the IJPS POES satellite telemetry (TIP or AIP or HRPT) acquired and provided by EUMETSAT.	PSOC -3.3.2.1-025/150 PSOC-3.3.2.2-020		D			
CSU-SOC-3.3.3-0020	In accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15]. The SOCC shall provide real time access to state-of-health telemetry data from NOAA instruments on Metop satellites	PSOC-3.3.2.1-200 PSOC-3.3.2.2-030		D			
CSU-SOC-3.3.3-0030	The SOCC and Backup SOCC shall provide the capability to simultaneously process telemetry received through EPS resources from IJPS POES satellites and telemetry received through PGS resources from POES (IJPS and pre-IJPS) satellites	PSOC-3.3.2.1-025/150 PSOC-3.3.2.2-020		D			
CSU-SOC-3.3.3-0040	The SOCC and Backup SOCC shall provide the capability to extract MHS telemetry from IJPS POES TIP, AIP, HRPT and GAC data streams.	PSOC-3.3.2.1-025/180/190		D			
CSU-SOC-3.3.3-0050	The SOCC and Backup SOCC shall have the capability to manage extracted IJPS POES MHS telemetry and to provide such telemetry data to the EPS CGS.	PSOC-3.3.2.1-025/180/190		D			
	3.3.4 Trending and Analysis						
CSU-SOC-3.3.4-0010	The SOCC and Backup SOCC shall provide the capability to monitor and assess long term trends in IJPS POES MHS parameters sufficient for anomaly detection and resolution and for nominal instrument command and control purposes.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		D			
CSU-SOC-3.3.4-0020	The SOCC shall provide the capability to assess CDA, communications element and the Suitland Interface quality of service for Metop blind orbit cross support.	PGSL-3.2.2.4-020/060 PSOC-3.3.2.3-010 PSOC-3.3.2.4-050/060		D			
	3.3.5 Commanding						
CSU-SOC-3.3.5-0010	The SOCC and Backup SOCC shall provide the capability to generate, validate, authenticate, and verify IJPS POES MHS instrument commands including real time commands.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-020		D			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-SOC-3.3.5-0020	The SOCC and Backup SOCC shall provide the capability to command MHS instruments by utilizing PGS resources.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-020		D			
CSU-SOC-3.3.5-0030	The SOCC and Backup SOCC shall provide the capability to command IJPS POES satellites by utilizing the commanding access provided by EUMETSAT through the EPS CGS	PSOC-3.3.2.1-020/025/130 PSOC-3.3.2.2-060		D			
CSU-SOC-3.3.5-0040	The SOCC and Backup SOCC shall provide the capability to format and transmit commands to the IJPS POES satellites via the EUMETSAT CGS in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PSOC-3.3.2.1-025/130		T,D			
CSU-SOC-3.3.5-0050	The SOCC and Backup SOCC shall provide the capability to ingest and process IJPS POES command echoes provided at the Darmstadt interface.	PSOC-3.3.2.1-025/140		D			
CSU-SOC-3.3.5-0060	The SOCC and Backup SOCC shall provide the capability to simultaneously command IJPS POES satellites using EPS resources and POES (IJPS and pre-IJPS) satellites using PGS resources.	PSOC-3.3.2.1-025/130 PSOC-3.3.2.2-020/060		T,A			
	3.3.6 Planning and Scheduling						
CSU-SOC-3.3.6-0010	The SOCC shall provide the capability to schedule FCDA, SOCC and communication resources in support of Metop blind orbit and contingency support operations.	PSOC-3.3.2.1-010/050/060/070/080		D			
CSU-SOC-3.3.6-0020	The SOCC and Backup SOCC shall provide the capability to schedule PGS CDA, operational SOCC, and communication resources in support of IJPS POES operations and Metop MHRPT data acquisitions.	PSOC-3.3.2.1-010/020/025/040/100/110/120/130/140/150 PSOC-3.3.2.2-020		D			
CSU-SOC-3.3.6-0030	The SOCC and Backup SOCC shall provide the capability to plan and schedule for the use of EPS CGS resources for IJPS POES blind orbit cross support operations.	PSOC-3.3.2.1-010/020/025/040/100/110/120/130/140/150 PSOC-3.3.2.2-020/040/060		D			
CSU-SOC-3.3.6-0040	The SOCC and Backup SOCC shall provide the capability to plan and schedule communication resources in support of acquisition of Metop GDS data from the Darmstadt Interface.	PSOC-3.3.2.1-025/030		D,A			
CSU-SPC-3.3.6-0050	The SOCC and Backup SOCC shall provide the capability to plan and schedule communications resources in support of acquisition of Metop IASI level 1c and GRAS, ASCAT and GOME-2 level 1b products from the Darmstadt Interface.	PSOC-3.3.2.1-025/030		D			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-SOC-3.3.6-0060	In accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15] the operational SOCC (SOCC or Backup SOCC) shall accept inputs for planning and scheduling from EUMETSAT.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-040		D			
CSU-SOC-3.3.6-0070	The SOCC and Backup SOCC shall provide the capability to utilize antenna RF masks and products from the Metop state vectors to plan and schedule CSU Metop support activities.	PSOC-3.3.2.1-025/030/050/060		D			
CSU-SOC-3.3.6-0080	The operational SOCC (SOCC or Backup SOCC) shall make available to EUMETSAT: 1) IJPS POES satellite orbit state vector updates (i.e., four line elements); 2) IJPS POES OBT/UTC time correlation updates and 3) other data as specified in the JORP [AD-14].	PSOC-3.3.2.1-025 PSOC-3.3.2.2-040		D			
CSU-SOC-3.3.6-0090	The SOCC and Backup SOCC shall provide the capability to create plans and schedules that include activities for the management of health and status of IJPS POES MHS instruments.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		D			
CSU-SOC-3.3.6-0100	The SOCC and Backup SOCC shall provide the capability to produce and update schedules based on IJPS space and ground asset maintenance needs.	PSOC-3.3.2.1-010/020/025/030/040/050/060/070/080/090/100/110/120/130/140/150/160/170/190/210		D			
CSU-SOC-3.3.6-0110	The SOCC and Backup SOCC shall provide the capability to generate IJPS POES satellite stored command tables that include commands for MHS instruments.	PSOC-3.3.1-025 PSOC3.3.2.2-010/020		D			
	3.3.7 Report generation						
CSU-SOC-3.3.7-0010	The SOCC and Backup SOCC shall provide the capability to generate reports used in the evaluation of PGS/IJPS performance.	PGSL-3.2.2.4-020/030/040/050/060/070/080/090/100/110 PSOC-3.3.2.1-025 PSOC-3.3.2.4-020/030/040/050/060/070		D			
CSU-SOC-3.3.7-0020	The SOCC shall provide the capability to compare and report the amount of expected data frames to actual data frames received for Metop downlink acquisitions at PGS CDAs.	PGSL-3.2.2.4-040/060/070/080/110 PSOC-3.3.2.4-020/050/060		D			
CSU-SOC-3.3.7-0030	The SOCC and Backup SOCC shall provide the capability to compare and report the amount of expected IJPS POES downlink data frames to actual data frames received through either PGS or EPS resources.	PSOC-3.3.2.4-040		D			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
	3.3.8 Database maintenance						
CSU-SOC-3.3.8-0010	The SOCC shall provide the capability to exercise version control of operational databases for IJPS satellites (POES and Metop).	PSOC-3.3.2.1-120 PSOC-3.3.2.2-010/020		D,A			
CSU-SOC-3.3.8-0020	The Backup SOCC shall provide the capability to exercise version control of operational databases for IJPS POES satellite.	PSOC-3.3.2.1-025/120 PSOC-3.3.2.2-010/020		D,A			
CSU-SOC-3.3.8-0030	The SOCC and Backup SOCC shall provide the capability for operators to modify IJPS POES operational databases for IJPS satellites.	PSOC-3.3.2.1-025/120 PSOC-3.3.2.2-010/020		D,A			
CSU-SOC-3.3.8-0040	Operational databases shall support IJPS POES MHS instrument operations.	PSOC-3.3.2.2-010/020		D,A			
CSU-SOC-3.3.8-0050	The SOCC shall provide the capability to maintain constellation information on up to TBD IJPS POES satellites and 2 Metop satellites in addition to required pre-IJPS POES satellites.	PSOC-3.3.2.1-120 PSOC-3.3.2.2-010/020		TA			
CSU-SOC-3.3.8-0060	The Backup SOCC shall provide the capability to maintain constellation information on up to TBD IJPS POES satellites in addition to the required pre-IJPS POES satellites.	PSOC-3.3.2.1-025/120 PSOC-3.3.2.2-010/020		TA			
	3.3.9 External Interfaces						
CSU-SOC-3.3.9-0010	The operational SOCC (SOCC or Backup SOCC) shall provide the capability to receive from the Communications Element the IJPS POES telemetry which was acquired by EUMETSAT.	PSOC-3.3.2.1-025/150 PSOC-3.3.2.2-010/020		D			
CSU-SOC-3.3.9-0020	The SOCC shall provide the capability to receive Metop ephemeris data (i.e. orbit prediction over the next 24 hours) from CEMSCS.	PSOC-3.3.2.1-030/050/060		D			
CSU-SOC-3.3.9-0030	The operational SOCC (SOCC or Backup SOCC) shall receive Metop OBT/UTC time correlation updates from the EPS CGS.	PGSL-3.2.2.4-110 PSOC-3.3.2.1-025 PSOC-3.3.2.2-040		D			
CSU-SOC-3.3.9-0040	The SOCC shall make requested MHS Telemetry available to EUMETSAT at the CGS control site in Darmstadt.	PSOC-3.3.2.1-190		D			
CSU-SOC-3.3.9-0050	The SOCC shall provide IJPS POES MHS data in engineering values.	PSOC-3.3.2.1-190		D.A			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-SOC-3.3.9-0060	The MHS data shall be made available in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PSOC-3.3.2.1-190		D			
CSU-SOC-3.3.9-0070	The SOCC and Backup SOCC shall be capable of a voice exchange with the CGS.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-030		D			
CSU-SOC-3.3.9-0080	The operational SOCC (SOCC and Backup SOCC) shall provide auxiliary and co-ordination data to EUMETSAT in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PSOC-3.3.2.1-025 PSOC-3.3.2.2-040		D			
CSU-SOC-3.3.9-0090	The SOCC and Backup SOCC shall receive auxiliary and co-ordination data from EUMETSAT in accordance with the NOAA Ground Segment to EPS Ground Segment ICD [AD-15].	PSOC-3.3.2.1-025 PSOC-3.3.2.2-040		D			
CSU-SOC-3.3.9-0100	The SOCC shall provide the capability to acquire one orbit buffer of IJPS POES GAC from the CGS Control Site in Darmstadt.	PSOC-3.3.2.1-040		D			
CSU-SOC-3.3.9-0110	The SOCC shall provide the capability to acquire one orbit buffer of Metop GDS from the CGS Control Site in Darmstadt.	PSOC_3.3.2.1-030		D			
	3.3.10 Performance						
CSU-SOC-3.3.10-0010	The SOCC and Backup SOCC shall provide the capability to simultaneously command 2 IJPS POES satellites utilizing two separate CDAs.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		T			
CSU-SOC-3.3.10-0020	The SOCC and Backup SOCC shall provide the capability to simultaneously process telemetry from 2 POES/IJPS POES satellites acquired by two separate CDAs.	PSOC-3.3.2.1-025 PSOC-3.3.2.2-010/020		T			
CSU-SOC-3.3.10-0030	The SOCC and Backup SOCC shall provide the capability to control CDA, operational SOCC, and Communications Element resources in such manner as to ensure that 98.8% (measured over any 30-day period) of the IJPS POES Global data acquired by the PGS is made available to the Suitland Interface in compliance with IJPS timeliness requirements.	PSOC-3.3.2.1-025 PSOC-3.3.2.4-040		T,A			
CSU-SOC-3.3.10-0040	The SOCC shall provide the capability to control CDA, SOCC, and Communications Element resources in such manner as to ensure that 98.8% (measured over any 30 day period) of Metop GDS blind orbit data acquired by the FCDA is be made available at the Suitland Interface in compliance with IJPS timeliness requirements.	PSOC-3.3.2.4-050		T,A			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-SOC-3.3.10-0050	The SOCC shall provide the capability to control CDA, SOCC, and Communications Element resources in such manner as to ensure that 98.8% (measured over any 30 day period) of the TM downlinked by Metop to the FCDA is made available to the Suitland Interface in compliance with IJPS timeliness requirements.	PSOC-3.3.2.4-060		T,A			
CSU-SOC-3.3.10-0060	The SOCC shall provide the capability to control CDA, SOCC, and Communications Element resources in such manner as to ensure that 98.8% (measured over any 30 day period) of the Metop TC provided at the Suitland Interface are successfully up-linked by the FCDA to Metop in compliance with IJPS timeliness requirements.	PGSL-3.2.2.2-040		T,A			
CSU-SOC-3.3.10-0070	The SOCC and Backup SOCC shall provide the capability to reconstitute an IJPS GAC acquisition chain through a CDA to the Suitland Interface in less than 360 minutes.	PSOC-3.3.2.1-025 PSOC-3.3.2.4-040		T,A			
CSU-SOC-3.3.10-0080	The SOCC shall provide the capability to reconstitute the GDS acquisition chain through the FCDA to the Suitland Interface in less than 360 minutes.	PSOC-3.3.2.4-050		T,A			
CSU-SOC-3.3.10-0090	The SOCC shall provide the capability to reconstitute the Metop TM acquisition chain through the FCDA to the Suitland Interface in less than 100 minutes	PSOC-3.3.2.4-060		T,A			
CSU-SOC-3.3.10-0100	The SOCC shall provide the capability to reconstitute the Metop TC transmission chain from the Suitland Interface through the FCDA in less than 100 minutes.	PGSL-3.2.2.2-040		T,A			
CSU-SOC-3.3.10-0110	The SOCC and Backup SOCC shall provide the capability to reconstitute an MHRPT acquisition chain through a CDA to the and Preprocessing System in less than 360 minutes.	PGSL-3.2.2.4-110 PSOC-3.3.2.1-025		T,A			
CSU-SOC-3.3.10-0120	The SOCC and Backup SOCC shall provide the capability to control CDA, operational SOCC, and Communications Element resources in such a manner as to ensure that TBD % (measured over any 30-day period) of the MHRPT data acquired by the PGS is made available to the and Preprocessing System within timeliness requirements.	PGSL-3.2.2.4-110 PSOC-3.3.2.1-025		T,A			
CSU-SOC-3.3.10-0130	The SOCC and Backup SOCC shall provide the capability to control Communications Element resources in such a manner as to ensure that 98.8% (TBC) (measured over any 30-day period) of the IJPS metrological data acquired by the PGS is provided to AFWA (TBC) in compliance with timeliness requirements.	PGSL-3.2.2.3-100 PSOC-3.3.2.1-025		T,A			

Requirement ID	Requirement Statement	Source Requirement	Allocated Requirement	Verification Level & Method			Rationale / Comments
				Ele.	PGS	IJPS	
CSU-SOC-3.3.10-0140	The SOCC and Backup SOCC shall provide the capability to generate a conflict-free schedule for up to two IJPS POES satellites and one Metop satellite.	PSOC-3.3.2.1-010/025/ PSOC-3.3.2.2-010		T,A			
CSU-SOC-3.3.10-0150	In accordance with IJPS GAC timeliness requirements, the SOCC shall make available to the EPS CGS at the Suitland Interface, 99.8% (measured over any 30-day period) of the IJPS POES Global data received from the Communications Element.	PSOC-3.3.2.4-040		T,A			
CSU-SOC-3.3.10-0160	In accordance with GDS timeliness requirements, the SOCC shall make available to the EPS CGS at the Suitland Interface, 99.8% (measured over any 30-day period) of the Metop GDS received from the Communications Element.	PSOC-3.3.2.4-050		T,A			
CSU-SOC-3.3.10-0170	In accordance with Metop telemetry timeliness requirements, the SOCC shall make available to the EPS CGS at the Suitland Interface, 99.8% (measured over any 30-day period) of the Metop telemetry received from the Communications Element.	PSOC-3.3.2.4-060		T,A			
CSU-SOC-3.3.10-0180	In compliance with Metop TC timeliness requirements, the SOCC shall deliver to the Communications Element 99.8% (measured over any 30-day period) of the Metop TC received at the Suitland Interface.	PGSL-3.2.2.2-040		T,A			
CSU-SOC-3.3.10-0190	The SOCC and Backup SOCC shall provide the capability to control Communications Element resources in such a manner as to ensure that TBD% (measured over a 30-day period) of the Metop IASI, GRAS, ASCAT and GOME-2 products made available at the Darmstadt Interface are transferred to the Ingest and Preprocessing System within timeliness requirements.	PGSL-3.2.2.3-020		T,A			
	3.3.11 Test and Training						
CSU-SOC-3.3.11-0010	The SOCC's and Backup SOCC's IJPS POES satellite emulation/simulation shall have the ability to receive command echoes provided by the EPS CGS.	PSOC-3.3.2.1-025/140		D			

Appendix B. Acronyms and Abbreviations

AD	Applicable Document
AFSCN	Air Force Satellite Control Network
AIP	AMSU Information Processor
AMSU	Advanced Microwave Sounding Unit
AVHRR	Advanced Very High Resolution Radiometer
ASCAT	Advanced Scatterometer
CDA	Command and Data Acquisition
CE	Communications Element
CEMSCS	Control Environmental Satellite Computer System
CGS	Core Ground Segment (EUMESTAT)
COTS	Commercial-Off-The-Shelf
CR	Find the Context
CSU	CDA/SOCC Upgrade
DCS	Data Collection System
DLT	Digital Linear Tape
DPS	Deep Space Network
DSN	Deep Space Network
EPS	EUMETSAT Polar System
ESA	European Space Agency
EU	Engineering Unit
EUMETSAT	European Organization for the Exploration of Meteorological Satellites
FCDA	Fairbanks Command and Data Acquisition
GAC	Global Area Coverage
GDS	Global Data Stream (Refers only to the X-band data from Metop satellite)
GOME	Global Ozone Monitoring Experiment
GRAS	Global Navigation Satellite System Receiver for Atmospheric Sounding
HIRS	High Resolution Infra-Red Sounder
HRPT	High Resolution Picture Transmission
IASI-TEC	IASI Technical Expertise Center
IASI	Infrared Atmospheric Sounding Interferometer
ID	Identification Document
IJPS	Initial Joint Polar-orbiting Operational Satellite System
ICD	Interface Control Document
IPS	Ingest and Preprocessing System
ISO	International Standards Organization
JORP	Joint Operations Rules and Procedures
LAC	Local Area Coverage
LRPT	Low Resolution Picture Transmission
LRU	Line Replaceable Unit
METOP	Metop Meteorological Operational Satellite
MHRPT	Metop HRPT
MHS	Microwave Humidity Sounder
NOAA	National Oceanic and Atmospheric Administration
NRZ-L	Non Return to Zero-L
NRZ-L-PSK	Non Return to Zero-L Phase Shift Keyed

OBT	On-Board Time
PCDAS	Polar Command and Data Acquisition Station
PGS	Polar Ground Segment
PIP	Program Implementation Plan
POES	Polar-orbiting Operational Environmental Satellite
QPSK	Quadrature Phase Shift Keyed
RF	Radio Frequency
RFI	Radio Frequency Interference
SAIP	Stored AIP
SARP	Search and Rescue Processor
SARSAT	Search and Rescue Instrument
SATCOM	Satellite Communications
SBUV	Solar Backscatter Ultra-Violet Spectral Radiometer
SEM	Space Environment Monitor
SOC	Satellite Operations Center
SOCC	Satellite Operations Control Center
SCR	System Commissioning Review
SCT	Stored Command Table
STIP	Stored TIP
TBD	To Be Determined
TBC	To Be Resolved
TC	Telecommand
TIP	TIROS Information Processor
TIROS	Television Infrared Observation Satellite
TM	Telemetry
TTRF	Time to Restore Function
UTC	Universal Time Clock
VCDU	Virtual Channel Data Units
VHF	Very High Frequency
V&V	Verification and Validation
WCDA	Wallops Command and Data Acquisition

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